AIR QUALITY PERMIT

Issued to: Plum Creek Manufacturing, L.P.
Columbia Falls Operations
P.O. Box 1990
Columbia Falls, Montana 59912

Permit #2667-12
Application Received: 09/22/04
Application Complete: 10/18/04
Preliminary Determination Issued: 11/15/04
Department Decision Issued: 12/01/04
Permit Final: 12/16/04
AFS Number: 029-0008

An air quality permit, with conditions, is hereby granted to Plum Creek Manufacturing, L.P. (Plum Creek), pursuant to Sections 75-2-204 and 211 of the Montana Code Annotated (MCA), as amended, and Administrative Rules of Montana (ARM) 17.8.740, *et seq*., as amended, for the following:

SECTION I: Permitted Facilities

A. Plant Location

Plum Creek's Columbia Falls facility is located in Section 7 and the SW¼ of Section 8, Township 30 North, Range 20 West, in Flathead County. The facility includes a sawmill, a planer, a plywood plant, and a medium density fiberboard (MDF) plant. The MDF plant has two production lines: Line 1 manufactures MDF through a batch press process and Line 2, through the use of a continuous press.

B. Permitted Facility

This permit is issued for all existing sources of air contaminants at the facility, including, but not limited to: two Line 1 MDF fiber dryers (core and face dryer systems) controlled by four wet electrostatic precipitators (ESPs) and heated by three sanderdust burners (the core dryer is heated by a 50-million British thermal units per hour (MMBtu/hr) Coen Burner and the face dryer is heated by two Energex Burners); two plywood veneer dryers controlled by one wet ESP and heated by one wood waste burner; one wood-fired stoker boiler with design capacity of 170,000 pounds per hour (lb/hr) steam controlled by one PPC Industries ESP; five sawmill and planer cyclones; one sawdust target box; seven drying kilns; two plywood plant cyclones; three plywood plant baghouses; twelve Line 1 MDF plant baghouses; one 96.4-MMBtu/hr natural gas/diesel fired boiler with a design capacity of 75,000 lb/hr steam; one Line 2 MDF flash tube fiber dryer controlled by two venturi scrubbers and three biofilters and heated by one 85-MMBtu/hr sanderdust burner; five Line 2 MDF plant baghouses; one Line 2 natural gas hot oil burner; and fugitive dust associated with the receiving, storing, and handling of logs and waste wood.

C. Current Permit Action

On October 18, 2004, Plum Creek submitted a complete Montana Air Quality Permit application to the Montana Department of Environmental Quality (Department) for the addition of a 1993 Babcock and Wilcox 96.4-MMBtu/hr (75,000 lb/hr) boiler to be fired on natural gas and diesel fuel. Plum Creek also plans to remove the 22,000 lb/hr CE Boiler and the 20,000 lb/hr Plywood Boiler. The current permitting action adds the 1993 Babcock and Wilcox 96.4-MMBtu/hr (75,000 lb/hr) boiler and updates the permit to reflect current permit language and rule references used by the Department.

SECTION II: Limitations and Conditions

A. Line 1 MDF Fiber Dryers

1. Hours of operation of the Line 1 MDF fiber dryers shall be limited to 8500 hours per year (hr/yr) (ARM 17.8.749).

2. Plum Creek shall operate and maintain the four ESPs on the Line 1 MDF fiber dryers (ARM 17.8.749).

3. Line 1 MDF fiber dryer emissions of total particulate shall be limited to 23.14 lb/hr (ARM 17.8.752).

4. Line 1 MDF fiber dryer emissions of particulate matter with an aerodynamic diameter of 10 microns or less (PM_{10}) shall be limited to 23.14 lb/hr (ARM 17.8.752).

5. Line 1 MDF fiber dryer emissions of Volatile Organic Compounds (VOC) shall be limited to 131.10 lb/hr (ARM 17.8.752).

6. Visible emissions from the Line 1 MDF fiber dryers shall be limited to 20% opacity averaged over 6 consecutive minutes (ARM 17.8.304).

7. The initial source test of the Line 1 MDF fiber dryer ESPs was conducted on December 18-19, 1995, to demonstrate compliance with the emission limitations contained in Sections II.A.3 and 4. Plum Creek shall continue testing on an every 3-year basis to demonstrate compliance with the emission limitations or another testing/monitoring schedule as approved by the Department. The test methods shall conform to 40 Code of Federal Regulations (CFR) Part 51, Appendix M, including back half, for PM_{10}; 40 CFR Part 60, Appendix A, including back half, for total particulate; and the Montana Source Test Protocol and Procedures Manual. The Department may allow a total particulate test if the back half is included and it is acknowledged this test can be used as a surrogate for PM_{10} (ARM 17.8.105 and ARM 17.8.106).

8. The initial VOC source test for the Line 1 MDF fiber dryers was conducted on December 18-19, 1995, to demonstrate compliance with the emission limitation contained in Section II.A.5. Plum Creek shall continue testing on an every 3-year basis to demonstrate compliance with the emission limitation or according to another testing/monitoring schedule as approved by the Department. The test methods shall conform to 40 CFR Part 60, Appendix A and the Montana Source Test Protocol and Procedures Manual (ARM 17.8.105 and ARM 17.8.106).

B. Line 2 MDF Fiber Dryers

1. Plum Creek shall install, operate, and maintain two venturi scrubbers with three biofilter stacks as control for the Line 2 MDF fiber dryers (ARM 17.8.749).

2. Plum Creek shall install, operate, and maintain a flue gas recirculation/low NO_X burner (FGR/LNB) on the heat source for the Line 2 MDF fiber dryer (ARM 17.8.752).

3. Total particulate emissions from the Line 2 MDF fiber dryer venturi scrubbers and biofilter stacks shall be limited to 21.2 lb/hr (ARM 17.8.752).

4. PM_{10} emissions from the Line 2 MDF fiber dryer venturi scrubbers and biofilter stacks shall be limited to 21.2 lb/hr (ARM 17.8.752).

5. VOC emissions from the Line 2 MDF fiber dryer combined stack shall be limited to 78.1 lb/hr (ARM 17.8.752).

6. Visible emissions from the Line 2 MDF fiber dryers combined stack shall be limited to 20% opacity averaged over 6 consecutive minutes (ARM 17.8.304).

7. The initial source test on the three Line 2 MDF fiber dryer biofilter stacks was conducted on September 11, 2002, to demonstrate compliance with the emission limitations contained in Sections II.B.3 and 4. Plum Creek shall continue testing on an every 3-year basis to demonstrate compliance with the emission limitations or according to another testing/monitoring schedule as approved by the Department. The test methods shall conform to 40 CFR Part 51, Appendix M, including back half, for PM_{10}; 40 CFR Part 60, Appendix A, including back half, for total particulate; and the Montana Source Test Protocol and Procedures Manual. The Department may allow a total particulate test if the back half is included and it is acknowledged this test can be used as a surrogate for PM_{10} (ARM 17.8.105 and ARM 17.8.106).

8. The initial source test on the three Line 2 MDF fiber dryer biofilter stacks was conducted on September 11, 2002, to demonstrate compliance with the emission limitation contained in Section II.B.5. Plum Creek shall continue testing on an every 3-year basis to demonstrate compliance with the emission limitation or according to another testing/monitoring schedule as approved by the Department. The test methods shall conform to 40 CFR Part 60, Appendix A and the Montana Source Test Protocol and Procedures Manual (ARM 17.8.105 and ARM 17.8.106).

C. Plywood Veneer Dryers

1. Plum Creek shall operate and maintain the ESP on the veneer dryers (ARM 17.8.749).

2. Plywood veneer dryer emissions of total particulate shall be limited to 10.00 lb/hr (ARM 17.8.749).

3. Plywood veneer dryer emissions of PM_{10} shall be limited to 10.00 lb/hr (ARM 17.8.749).

4. Visible emissions shall be limited to 20% opacity averaged over 6 consecutive minutes (ARM 17.8.304).

5. The initial source test for the plywood veneer dryers was conducted on September 19, 1995, to demonstrate compliance with emission limitations contained in Section II.C.2 and 3. The testing shall continue on an every 3-year basis to demonstrate compliance with the emission limitations or according to another testing/monitoring schedule as approved by the Department. The test methods shall conform to 40 CFR Part 51, Appendix M, including back half, for PM_{10}; 40 CFR Part 60, Appendix A, including back half, for total particulate; and the Montana Source Test Protocol and Procedures Manual. The Department may

allow a total particulate test if the back half is included and it is acknowledged this test can be used as a surrogate for PM_{10} (ARM 17.8.105 and ARM 17.8.106).

D. Riley-Union Stoker Boiler (wood-fired)

1. Plum Creek shall operate and maintain the ESP on the Riley-Union Stoker boiler (ARM 17.8.752).

2. Boiler emissions of total particulate shall be limited to 8.77 lb/hr (ARM 17.8.752).

3. Boiler emissions of PM_{10} shall be limited to 6.94 lb/hr (ARM 17.8.752 and ARM 17.8.749).

4. Boiler emissions of NO_X[1] shall be limited to 134.50 lb/hr (ARM 17.8.752).

5. Boiler emissions of CO shall be limited to 468 lb/hr (ARM 17.8.752).

6. Visible emissions shall be limited to 20% opacity averaged over 6 consecutive minutes (ARM 17.8.304).

7. The initial source test on the wood-fired boiler ESP was conducted on July 18, 1995, to demonstrate compliance with emission limitations contained in Sections II.D.2 and 3. Plum Creek shall continue testing on an every 3-year basis to demonstrate compliance with the emission limitations or according to another testing/monitoring schedule as approved by the Department. The test methods shall conform to 40 CFR Part 51, Appendix M, including back half, for PM_{10}; 40 CFR Part 60, Appendix A, including back half, for total particulate; and the Montana Source Test Protocol and Procedures Manual. The Department may allow a total particulate test if the back half is included and it is acknowledged this test can be used as a surrogate for PM_{10} (ARM 17.8.105 and ARM 17.8.106).

8. A source test on the wood-fired boiler was conducted on July 18, 1995, to test for NO_X and CO, concurrently, and to demonstrate compliance with the emission limitations contained in Sections II.D.4 and 5. Plum Creek shall continue testing on an every 3-year basis to demonstrate compliance with the emission limitations or according to another testing/monitoring schedule as approved by the Department. The test methods shall conform to 40 CFR Part 60, Appendix A and the Montana Source Test Protocol and Procedures Manual (ARM 17.8.105 and ARM 17.8.106).

E. Combined Sawmill and Planer Process

1. Plum Creek shall comply with the emission limitations contained in Table 1 (ARM 17.8.749).

Table 1

Emission Unit	Total Particulate Emissions	PM_{10} Emissions
Planer #3 Cyclone	5.55 lb/hr	2.22 lb/hr
Planer #4 Cyclone	13.90 lb/hr	5.55 lb/hr

[1] NO_x reported as NO_2.

Planer Shavings Bin Cyclone	1.39 lb/hr	0.56 lb/hr
Planer Chip Bin Cyclone	1.39 lb/hr	0.56 lb/hr
Sawmill Chip Bin Cyclone	1.39 lb/hr	0.56 lb/hr

2. Visible emissions from all emission points contained in the combined sawmill and planer process shall each be limited to 20% opacity averaged over 6 consecutive minutes (ARM 17.8.304).

3. If any point source within the combined sawmill and planer process exceeds an applicable opacity limit, the Department may require all point sources in that process to be tested to determine compliance with mass emission limits. These tests shall conform to Environmental Protection Agency (EPA) test specifications under 40 CFR 60, Appendix A, including back half. PM_{10} tests shall conform to 40 CFR 51, Appendix M, including back half and the Montana Source Test Protocol and Procedures Manual. All sources where tests are required must be equipped with stacks and sampling ports, with safe access for the sampling personnel. The Department may allow a total particulate test if the back half is included and it is acknowledged this test can be used as a surrogate for PM_{10} (ARM 17.8.105 and ARM 17.8.106).

F. Total Plywood Process Excluding the Veneer Dryers

1. Plum Creek shall comply with the emission limitations contained in Table 2 (ARM 17.8.749 and ARM 17.8.752).

Table 2

Emissions Unit	Total Particulate Emissions	PM_{10} Emissions
Plywood Chip Bin Cyclone	1.30 lb/hr	0.52 lb/hr
Plywood Sander Dust Baghouse	1.35 lb/hr	1.35 lb/hr
Plywood 18" Trim Hog Baghouse	0.58 lb/hr	0.58 lb/hr
Plywood 30" Trim Hog Baghouse	0.58 lb/hr	0.58 lb/hr

2. Visible emissions from all emission points contained in the total plywood process, excluding the veneer dryers, shall each be limited to 20% opacity averaged over 6 consecutive minutes (ARM 17.8.304).

3. If any point source within the total plywood process, excluding the veneer dryers, exceeds an applicable opacity limit, the Department may require all point sources in that process to be tested to determine compliance with mass emission limits. These tests shall conform to EPA test specifications under 40 CFR 60, Appendix A, including back half. PM_{10} tests shall conform to 40 CFR 51, Appendix M, including back half and the Montana Source Test Protocol and Procedures Manual. All sources where tests are required must be equipped with stacks and sampling ports, with safe access for the sampling personnel. The Department may allow a total particulate test if the back half is included and it is acknowledged this test can be used as a surrogate for PM_{10} (ARM 17.8.105 and ARM 17.8.106).

G. Total Line 1 MDF Process Excluding Drying

1. Hours of operation for the Line 1 MDF process shall be limited to 8500 hr/yr (ARM 17.8.749).

2. Plum Creek shall operate and maintain the Line 1 MDF materials handling baghouse (ARM 17.8.752).

3. Plum Creek shall comply with the emission limitations contained in Table 3 (ARM 17.8.752 and ARM 17.8.749).

Table 3

Emission Unit	Total Particulate Emissions	PM_{10} Emissions
Line 1 MDF North Sander Baghouse #7	2.12 lb/hr	2.12 lb/hr
Line 1 MDF South Sander Baghouse #8	2.12 lb/hr	2.12 lb/hr
Line 1 MDF Board Trim Baghouse #10	0.52 lb/hr	0.52 lb/hr
Line 1 MDF Boiler Sanderdust Baghouse #11	0.84 lb/hr	0.84 lb/hr
Line 1 MDF Booksaw Baghouse #5	1.93 lb/hr	1.93 lb/hr
Line 1 MDF Sander Hog Baghouse #6	1.93 lb/hr	1.93 lb/hr
Line 1 MDF Metering Bin Baghouse #1	1.93 lb/hr	1.93 lb/hr
Line 1 MDF Felter Baghouse #1	1.93 lb/hr	1.93 lb/hr
Line 1 MDF Felter Baghouse #2	1.93 lb/hr	1.93 lb/hr
Line 1 MDF Sanderdust Fuel Baghouse	0.16 lb/hr	0.16 lb/hr
Line 1 MDF ADS Baghouse (includes both baghouses)	1.93 lb/hr	1.93 lb/hr

4. Total combined emissions from the 6 press vent fans and the 10 board cooler fan vents shall be limited to 25.80 lb/hr of total particulate (ARM 17.8.752).

5. Total combined emissions from the 6 press vent fans and the 10 board cooler fan vents shall be limited to 9.50 lb/hr of PM_{10} (ARM 17.8.752).

6. Total combined emissions from the 6 press vent fans and the 10 board cooler fan vents shall be limited to 13.40 lb/hr of VOC (ARM 17.8.752).

7. Visible emissions from all emission points contained in the total Line 1 MDF process, excluding drying, shall each be limited to 20% opacity averaged over 6 consecutive minutes (ARM 17.8.304).

8. An initial source test for the Line 1 MDF ADS baghouse was conducted on September 19, 1995, to demonstrate compliance with the limitations contained in Table 3. Plum Creek shall continue the testing on an every 3-year basis to demonstrate compliance with the emission limitations or according to another testing/monitoring schedule as approved by the Department. The test methods shall conform to 40 CFR Part 51, Appendix M, including back half, for PM_{10}; 40 CFR Part 60, Appendix A, including back half, for total particulate; and the Montana Source Test Protocol and Procedures Manual. The Department may allow a total particulate test only if the back half is included and it is acknowledged this test can be used as a surrogate for PM_{10} (ARM 17.8.105 and ARM 17.8.106).

9. If any point source within the total Line 1 MDF process, excluding drying, exceeds an applicable opacity limit, the Department may require all point sources in that process to be tested to determine compliance with mass emission limits. These tests shall conform to EPA test specifications under 40 CFR 60, Appendix A, including back half. PM_{10} tests shall conform to 40 CFR 51, Appendix M, including back half and the Montana Source Test Protocol and Procedures Manual. All sources where tests are required must be equipped with stacks and

sampling ports, with safe access for the sampling personnel. The Department may allow a total particulate test only if the back half is included and it is acknowledged this test can be used as a surrogate for PM_{10} (ARM 17.8.105 and ARM 17.8.106).

H. Total Line 2 MDF Process Excluding Drying

1. Plum Creek shall install, operate, and maintain the Line 2 North and South MDF Sander Baghouses (ARM 17.8.752).

2. Plum Creek shall install, operate, and maintain the Line 2 MDF Reject Baghouse and Line 2 MDF Forming Baghouse (ARM 17.8.752).

3. Plum Creek shall install, operate, and maintain the Line 2 Burner Fuel Baghouse (ARM 17.8.752).

4. Emissions from the press vents shall be routed to the venturi scrubber and biofilters (ARM 17.8.752).

5. Plum Creek shall comply with the emission limitations contained in Table 4 (ARM 17.8.752 and ARM 17.8.749).

Table 4

Emission Unit	Total Particulate Emissions	PM_{10} Emissions
Line 2 MDF North Sander Baghouse	2.14 lb/hr	2.14 lb/hr
Line 2 MDF South Sander Baghouse	2.14 lb/hr	2.14 lb/hr
Line 2 MDF Reject Baghouse	3.43 lb/hr	3.43 lb/hr
Line 2 MDF Forming Baghouse	2.14 lb/hr	2.14 lb/hr
Line 2 MDF Coen Fuel Bin Baghouse	0.43 lb/hr	0.43 lb/hr

6. Visible emissions from all emission points contained in the total Line 2 MDF process, excluding drying, shall each be limited to 20% opacity averaged over 6 consecutive minutes (ARM 17.8.304).

7. The initial source test on the Line 2 MDF North and South Sander Baghouse was conducted on September 12, 2002, to demonstrate compliance with the limitations contained in Table 4. Plum Creek shall continue the testing on an every 3-year basis to demonstrate compliance with the emission limitations contained in Table 4 or according to another testing/monitoring schedule as approved by the Department. The test methods shall conform to 40 CFR Part 51, Appendix M, including back half, for PM_{10}; 40 CFR Part 60, Appendix A, including back half, for total particulate; and the Montana Source Test Protocol and Procedures Manual. The Department may allow a total particulate test only if the back half is included and it is acknowledged this test can be used as a surrogate for PM_{10} (ARM 17.8.105 and ARM 17.8.106).

8. The initial source test on the Line 2 MDF Reject Baghouse was conducted on September 12, 2002, to demonstrate compliance with the limitations contained in Table 4. Plum Creek shall continue the testing on an every 3-year basis to demonstrate compliance with the emission limitations or according to another testing/monitoring schedule as approved by the Department. The test methods shall conform to 40 CFR Part 51, Appendix M, including back half, for PM_{10}; 40 CFR Part 60, Appendix A, including back half, for total particulate; and the

Montana Source Test Protocol and Procedures Manual. The Department may allow a total particulate test only if the back half is included and it is acknowledged this test can be used as a surrogate for PM_{10} (ARM 17.8.105 and ARM 17.8.106).

9. The initial source test on the Line 2 MDF Forming Baghouse was conducted on September 12, 2002, to demonstrate compliance with the limitations contained in Table 4. Plum Creek shall continue the testing on an every 3-year basis to demonstrate compliance with the emission limitations or according to another testing/monitoring schedule as approved by the Department. The test methods shall conform to 40 CFR Part 51, Appendix M, including back half, for PM_{10}; 40 CFR Part 60, Appendix A, including back half, for total particulate; and the Montana Source Test Protocol and Procedures Manual. The Department may allow a total particulate test only if the back half is included and it is acknowledged this test can be used as a surrogate for PM_{10} (ARM 17.8.105 and ARM 17.8.106).

10. If any point source within the total Line 2 MDF process, excluding drying, exceeds an applicable opacity limit, the Department may require all point sources in that process to be tested to determine compliance with mass emission limits. These tests shall conform to EPA test specifications under 40 CFR 60, Appendix A, including back half. PM_{10} tests shall conform to 40 CFR 51, Appendix M, including back half and the Montana Source Test Protocol and Procedures Manual. All sources where tests are required must be equipped with stacks and sampling ports, with safe access for the sampling personnel. The Department may allow a total particulate test only if the back half is included and it is acknowledged this test can be used as a surrogate for PM_{10} (ARM 17.8.105 and ARM 17.8.106).

I. Fugitive Dust from Mill Vehicles and Log Yard Activity

1. A chemical dust suppressant shall be applied to the major roads on the log yard to control fugitive dust from all log-handling equipment. The application schedule shall be no less than once per year. Water sprays shall be used as necessary to control dust emissions on active areas of the log yard. The opacity of the log yard dust emissions shall not exceed 20% averaged over 6 consecutive minutes at any time (ARM 17.8.308).

2. Chemical dust suppressants shall be applied to the major haul routes throughout the plant to control fugitive dust from the haul trucks. The application schedule shall be not less than once per year. The opacity of the haul road dust emissions shall not exceed 20% averaged over 6 consecutive minutes at any time (ARM 17.8.308).

J. 96.4-MMBtu/hr Natural Gas/Diesel Boiler

1. Emissions of total particulate from the boiler shall be limited to 0.73 lb/hr when burning natural gas (ARM 17.8.752).
2. Emissions of PM_{10} from the boiler shall be limited to 0.73 lb/hr when burning natural gas (ARM 17.8.752).

3. Emissions of total particulate from the boiler shall be limited to 1.37 lb/hr when burning diesel fuel (ARM 17.8.752).

4. Emissions of PM_{10} from the boiler shall be limited to 1.37 lb/hr when burning diesel fuel (ARM 17.8.752).

5. Boiler emissions of NO_X[2] shall be limited to 6.75 lb/hr and 0.07 pounds per million British thermal units (lb/MMBtu) when burning natural gas (ARM 17.8.752).

6. Boiler emissions of NO_X[3] shall be limited to 13.74 lb/hr when burning diesel fuel (ARM 17.8.752).

7. Boiler emissions of CO shall be limited to 7.91 lb/hr and 0.082 lb/MMBtu when burning natural gas (ARM 17.8.752).

8. Boiler emissions of CO shall be limited to 3.44 lb/hr when burning diesel fuel (ARM 17.8.752).

9. Diesel fuel burned in the boiler shall have sulfur content of 0.05% or less (ARM 17.8.752).

10. Burning of diesel fuel shall be limited to 165,000 gallons during any rolling 12-month time period (ARM 17.8.752).

11. Visible emissions shall be limited to 20% opacity averaged over 6 consecutive minutes (ARM 17.8.304).

12. Plum Creek shall comply with all applicable standards and limitations, and the monitoring, recordkeeping and reporting requirements contained in 40 CFR Part 60 for the boiler. The following subparts, at a minimum, are applicable (ARM 17.8.340):

    a. Subpart A - General Provisions applies to all equipment or facilities subject to an NSPS subpart listed below.

    b. Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units.

13. The boiler shall be initially tested while burning natural gas for NO_X and CO, concurrently, to demonstrate compliance with the emission limits in Sections II.J.5 and 7. The initial source testing shall be conducted within 180 days of the initial start up date of the boiler (ARM 17.8.105 and ARM 17.8.749).

14. The boiler shall be initially tested while burning diesel fuel for NO_X and CO, concurrently, to demonstrate compliance with the emission limits in Sections II.J.6 and 8. The initial source testing shall be conducted within 180 days of the initial start up date of the boiler (ARM 17.8.105 and ARM 17.8.749).

[2] NO_X reported as NO_2.

[3] NO_X reported as NO_2.

K. Additional Testing Requirements

1. The Department may require further testing (ARM 17.8.105).

2. Plum Creek shall comply with the requirements contained in the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).

L. Monitoring Requirements

No ambient monitoring is required at this time.

M. Operational Reporting Requirements

1. Plum Creek shall supply the Department with annual production information for all emission points, as required by the Department in the annual emission inventory request. The request will include, but is not limited to, all sources of emissions identified in the emission inventory contained in the permit analysis.

   Production information shall be gathered on a calendar-year basis and submitted to the Department by the date required in the emission inventory request. Information shall be in the units required by the Department. This information may be used for calculating operating fees, based on actual emissions from the facility, and/or to verify compliance with permit limitations (ARM 17.8.505). Plum Creek shall submit the following information annually to the Department by March 1 of each year; the information may be submitted along with the annual emission inventory (ARM 17.8.505).

   Hours of operation of the 96.4-MMBtu/hr boiler while burning diesel fuel

2. Plum Creek shall notify the Department of any construction or improvement project conducted pursuant to ARM 17.8.745, that would include a change in control equipment, stack height, stack diameter, stack flow, stack gas temperature, source location or fuel specifications, or would result in an increase in source capacity above its permitted operation or the addition of a new emission unit. The notice must be submitted to the Department, in writing, 10 days prior to start up or use of the proposed de minimis change, or as soon as reasonably practicable in the event of an unanticipated circumstance causing the de minimis change, and must include the information requested in ARM 17.8.745(1)(d) (ARM 17.8.745).

3. All records compiled in accordance with this permit must be maintained by Plum Creek as a permanent business record for at least 5 years following the date of the measurement, must be available at the plant site for inspection by the Department and must be submitted to the Department upon request (ARM 17.8.749).

4. Plum Creek shall submit the hours of operation of the Line 1 MDF plant annually to the Department by March 1 of each year; the information may be submitted with the emission inventory (ARM 17.8.505).

SECTION III: General Conditions

A. Inspection – Plum Creek shall allow the Department's representatives access to the source at all reasonable times for the purpose of making inspections or surveys, collecting

samples, obtaining data, auditing any monitoring equipment (CEMS, CERMS) or observing any monitoring or testing, and otherwise conducting all necessary functions related to this permit.

B. Waiver – The permit and the terms, conditions, and matters stated herein shall be deemed accepted if Plum Creek fails to appeal as indicated below.

C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving Plum Creek of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq*. (ARM 17.8.756).

D. Enforcement – Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties or other enforcement action as specified in Section 75-2-401, *et seq*., MCA.

E. Appeals – Any person or persons jointly or severally adversely affected by the Department's decision may request, within 15 days after the Department renders it's decision, upon affidavit setting forth the grounds therefore, a hearing before the Board of Environmental Review (Board). A hearing shall be held under the provisions of the Montana Administrative Procedures Act. The filing of a request for a hearing does not stay the Department's decision, unless the Board issues a stay upon receipt of a petition and a finding that a stay is appropriate under Section 75-2-211(11)(b), MCA. The issuance of a stay on a permit by the Board postpones the effective date of the Department's decision until conclusion of the hearing and issuance of a final decision by the Board. If a stay is not issued by the Board, the Department's decision on the application is final 16 days after the Department's decision is made.

F. Permit Inspection – As required by ARM 17.8.755, Inspection of Permit, a copy the air quality permit shall be made available for inspection by the Department at the location of the source.

G. Permit Fee – Pursuant to Section 75-2-220, MCA, as amended by the 1991 Legislature, failure to pay the annual operation fee by Plum Creek may be grounds for revocation of this permit, as required by that section and rules adopted thereunder by the Board.

Permit Analysis
Plum Creek Manufacturing, L.P.
Columbia Falls Facility
Permit #2667-12

I. Introduction/Process Description

A. Site Location

Plum Creek Manufacturing, L.P. (Plum Creek) currently operates a sawmill, planer, plywood plant, and medium density fiberboard (MDF) plant in Section 7 and the SW¼ of Section 8, Township 30 North, Range 20 West, Flathead County, Montana, near Columbia Falls. The nearest Class I area is Glacier National Park, which is approximately 13 kilometers northeast of the facility.

B. Process Description

This facility consists of three plants, all located at the same site: the sawmill, the plywood mill, and the MDF plant. The sawmill and plywood mill receive raw logs by truck. The logs are stored and sorted before being transferred to the mill for sawing into dimension lumber or to the plywood plant for peeling into veneer. Waste wood such as chips, sawdust, and planer shavings are transferred to the MDF plant for processing into fiberboard. Wood shavings and sawdust are also received from outside facilities as raw material for the fiberboard plant. All three plants share one boiler as a source of process steam for their operations. The boiler uses wood as a fuel and burns a mixture of bark, sawdust, sanderdust, and reject material from the plywood and fiberboard operations. The veneer dryer is also heated with wood through the use of a Wellons cell. The exhaust gases from the Wellons unit make direct contact with the veneer and then exit to the atmosphere through an E-tube wet electrostatic precipitator (ESP). This scrubber was installed during the summer of 1991 and reduced veneer dryer emissions from those recorded during the study period of September 1989, through April 1990.

The fiber dryers are heated primarily with wood. Two Coen and two Energex sander dust burners heat the flash-tube dryers to dry the wood fiber for fiberboard manufacture. The dryers are controlled with long cone high-efficiency cyclones, four GeoEnergy E-tube wet ESPs, two venturi scrubbers, and three biofilters.

Fugitive emissions from wood-waste transfer are controlled with baghouses or cyclones. Fugitive emissions from haul roads and the log deck are controlled with chemical dust suppressant. The equipment associated with this facility at the time of Permit Action #2667-12 is listed below.

Permitted Process Equipment and Control Equipment:

1. The MDF fiber dryers include face and core dryer(s). The Line 1 Core dryer consists of a sanderdust Coen burner with a heating capacity of 50 million British thermal units per hour (MMBtu/hr). The Line 2 Core dryer consists of a sanderdust burner with a heating capacity of 85 MMBtu/hr. The two Energex face dryers are proposed to be replaced by one burner with a capacity of 50 MMBtu/hr[4]. The Line 1 MDF fiber dryers are controlled with four GeoEnergy

[4] Permit #**2667-05** permitted the replacement of the two Energex burners with one Coen burner with a capacity of 50 MMBtu/hr. Section III.H. requires construction to begin by 4/17/98, otherwise Plum Creek must request an extension of time and/or a permit modification to commence construction.

E-tube wet ESPs. Each ESP is designed to accommodate a stack flow of 70,000 actual cubic feet per minute (acfm) (280,000 acfm total). The dryers are capable of processing 57 ton per hour (ton/hr) of bone dry fiber. The Line 2 MDF fiber dryers are controlled with two venturi scrubbers and three biofilters with a total stack flow of 600,000 acfm.

2. Two plywood veneer dryers with one Geo-Energy wet ESP control, and a combined design capacity of 22,100 square feet per hour (ft^2/hr) of plywood on a 3/8-inch basis. The veneer dryers are heated with a Wellons unit, which has a design capacity of 30 MMBtu/hr.

3. One wood-fired Riley-Union Stoker boiler with a current input capacity of 292.4 MMBtu/hr firing rate. This boiler is controlled with a PPC Industries ESP and has a maximum steaming capacity of 170,000 pounds per hour (lb/hr) of steam.

4. The combined sawmill and planer process includes the following point sources of emissions:

Description	Flow (acfm)
Planer #3 Cyclone	24,000
Planer #4 Cyclone	60,000
Planer Shavings Bin Cyclone	6,000
Planer Chip Bin Cyclone	6,000
Sawmill Chip Bin Cyclone	6,000
Sawmill Sawdust Target Box	6,000
Seven Drying Kilns	NA

5. Total plywood process excluding the veneer dryers. This process includes the following point sources of emissions:

Description	Flow (acfm)
Plywood Chip Bin Cyclone	5,560
Plywood Sander Baghouse	35,000
Plywood 18" Trim Baghouse	15,000
Plywood 30" Trim Baghouse	15,000

6. Total MDF process excluding drying. This process includes the following point sources of emissions:

Description	Flow (acfm)
Line 1 MDF N. Sander Baghouse	55,000
Line 1 MDF S. Sander Baghouse	55,000
Line 1 MDF Board Trim Baghouse	13,400
Line 1 MDF Sanderdust Fuel Baghouse	4,100
Line 1 MDF Boiler Sanderdust Baghouse	21,700
Line 1 MDF Booksaw Baghouse	50,000
Line 1 MDF Sander Hog Baghouse	50,000
Line 1 MDF Metering Bin Baghouse	50,000
Line 1 MDF Fire Dump Cyclone (emergency only)	
Line 1 MDF Felter Baghouse #1	50,000
Line 1 MDF Felter Baghouse #2	50,000
Line 1 MDF Reject Fiber Cyclone & Baghouse	Vents inside
Line 1 MDF ADS Baghouse	50,000
Line 2 MDF North Sander Baghouse	50,000 dscfm
Line 2 MDF South Sander Baghouse	50,000 dscfm
Line 2 MDF Reject Baghouse	80,000 dscfm
Line 2 MDF Forming Baghouse	50,000 dscfm
Line 2 Coen Fuel Bin Baghouse	4,100 dscfm

7. Fugitive dust from mill vehicles and log yard activity.

8. One natural gas/diesel boiler with a design capacity of 75,000 lb/hr steam (96.4 MMBtu/hr input).

C. Permit History

Prior to Permit Modification **#2667-02**, only the plywood veneer dryer (#2667), the Wellons unit (#1501), the Line 1 MDF fiber dryers (#2233), new baghouses at the Line 1 MDF plant (#2174), and the original Line 1 MDF plant (#5640051073) were subject to air quality permits. The sawmill and the plywood plant pre-date the Montana Clean Air Act and were not required to obtain a permit unless a modification of the source occurred, or a standard changed affecting the facility. Permit #2667-02 replaced Permit **#2667-01**.

On January 5, 1994, Permit **#2667-03** was issued to Plum Creek for the installation of the Combustion Engineering natural gas boiler. This boiler supplies the steam necessary for the lumber drying kilns to operate year round. Prior to this installation, the steam supplied to the lumber drying kilns was shut off due to the increased demand for steam from the rest of the facility during the winter months. The lumber that was intended to be dried in the kilns was stacked outside and allowed to air dry as much as possible. When capacity allowed, this lumber was then placed in the kiln for a final polishing dry, if necessary. Permit #2667-03 replaced Permit #2667-02.

On July 11, 1994, Permit **#2667-04** was issued to Plum Creek for the construction and operation of an ESP on the wood-fired Riley-Union Stoker boiler. This ESP replaced the wet scrubber that was used to control emissions from the boiler. This installation alleviated back pressure on the boiler that allowed the steam production to increase to 170,000 lb/hr and also increased the maximum input capacity to 292.4 MMBtu/hr. This additional steam was sufficient to allow for a plant production increase of 13%.

At the MDF plant, an additional sander, an air density separator, and a blow hog were proposed to be installed. The emissions from the sander are controlled by a baghouse (the Line 1 MDF sander baghouse). The emissions from the air density separator and the blow hog vent to the Line 1 MDF materials handling baghouses. In addition, secondary refiners were installed in the Line 1 MDF process to improve fiber quality and two more platens were added to the Line 1 MDF press to increase the capacity of the press.

To offset the increase in particulate emissions from the construction of the new sources and the increase in production capabilities, Plum Creek agreed to reduce the enforceable emission rate from the veneer dryers. In 1991, Plum Creek installed an ESP on the veneer dryer stack at the Columbia Falls plywood plant. Although the ESP was required to be installed on the stack to control opacity, a decrease in particulate emissions was also achieved. The decrease in particulate emissions had not been reflected in the permit or the State Implementation Plan (SIP) until the issuance of this permit. Conditions in Permit #2667-04 reduced particulate emissions from this project below significance levels.

The construction of the new sources of emissions, coupled with the increase in production capabilities, resulted in a net decrease of total particulate of 26.4 ton per year (tpy), a net increase in particulate matter less than 10 microns in diameter (PM_{10}) of 5.6 tpy, a net increase in nitrogen oxides (NO_X) of 315 tpy, a net increase in carbon monoxide (CO) of 162 tpy, a net increase in Volatile Organic Compounds (VOC) of 97.7 tpy, and a negligible increase in toxic air pollutants (TAP). The emissions increase of NO_X, CO, and VOC exceeded significance levels and were, therefore, subject to a New Source Review (NSR)/ Prevention of Significant Deterioration (PSD) review.

Since this permit was subject to PSD review, the Federal Land Managers (FLMs) were given an opportunity to review the application submitted by Plum Creek. Through the course of the FLM review, Plum Creek was asked to conduct additional modeling for Air Quality Related Values (AQRV), namely episodic acidification in Glacier National Park, and also a regional haze analysis. Bison Engineering, on behalf of Plum Creek, submitted additional modeling verifying that the increase in NO_X emissions resulted in a potential of hydrogen (pH) change less than 0.01 units in the two lakes that were analyzed. One of the FLMs, the National Park Service (NPS), then conducted a regional haze analysis and determined that this alteration would not contribute significantly to visibility degradation in Glacier National Park.

In addition to the modeling requests, the NPS requested that Plum Creek supply more information supporting the Best Available Control Technology (BACT) conclusions in the application. The NPS requested that the BACT analysis for the boiler also address Selective Non-Catalytic Reduction (SNCR) for the control of NO_X from the boiler.

Also, the NPS requested that Plum Creek further explain assumptions made in the BACT analysis for the control of particulate from the Line 1 MDF fiber dryers. Plum Creek submitted this information to the Department of Environmental Quality (Department) as requested.

After Plum Creek submitted the additional information, the Department determined this information was sufficient to support the original BACT conclusions contained in the application and the Preliminary Determination (PD) was then issued. Permit #2667-04 replaced Permit #2667-03.

On April 17, 1995, Permit **#2667-05** was issued to Plum Creek for the installation of four GeoEnergy E-tube wet ESPs on the stacks of the Line 1 MDF fiber dryers. Each ESP was designed to accommodate a stack flow of 70,000 acfm (280,000 acfm total) and resulted in a net decrease in particulate emissions from the Line 1 MDF fiber dryers. The four ESPs vent to a single stack.

Plum Creek also proposed to replace the two Energex burners used to heat the face dryer with a larger Coen burner. The Coen burner has a heating capacity of 50 MMBtu/hr. This increase in available heat to the Line 1 MDF Fiber Dryers, along with Plum Creek's proposed installation of two additional platens for the Line 1 MDF Press, increased the capacity of the dryers from 37 ton/hr of bone dry fiber processed to 57 ton/hr of bone dry fiber processed. This production increase resulted in a significant net emissions increase in VOC of 94 ton/year. Therefore, Permit #2667-05 was subject to a PSD review for VOC. There were also insignificant increases in NO_X, CO, and sulfur dioxide (SO_2) as a result of this production increase; but no net increase in particulate because of the installation of the ESPs.

Plum Creek also proposed to change the allowable emissions for the baghouses at the facility. The previous method of determining the allowable emissions was to assume that baghouses were 90% more efficient than cyclones. Manufacturers typically guaranteed an emission rate of 0.005 grains per dry standard cubic foot (gr/dscf) for baghouses. The allowable emissions for the baghouses were changed to the pound-per-hour equivalent of the 0.005 gr/dscf emission rate.

In addition, Plum Creek proposed to re-install an existing cyclone in the Line 1 MDF raw materials storage building. This 10,000 acfm cyclone is called the board trim cyclone and vents inside the Line 1 MDF building. This cyclone allows trim to be recycled into the Line 1 MDF process. The emissions from this cyclone are controlled by the existing Line 1 MDF material handling baghouse.

Plum Creek also proposed to re-configure the Line 1 MDF materials handling baghouse that was permitted in the Permit #2667-04. In Permit #2667-04, a single baghouse with an airflow of 70,000 dry standard cubic feet per minute (dscfm) was permitted at the Line 1 MDF materials handling building. Plum Creek proposed to change the configuration of this baghouse to 2 - 25,000 dscfm units because of changes to the project design. The units vent to one common stack.

As a final modification to their facility under this permit action, Plum Creek proposed to install an ESP between the Wellons cell and the veneer dryers. The ESP removes particulate from the gas stream used to heat the veneer dryers and provides for higher product quality. This ESP is not a source of emissions or a stack associated with a source of emissions. However, the installation of the ESP constituted a changed condition of operation that did not result in an increase in emissions. Therefore, Plum Creek's permit was modified to reflect the changed operating condition. This modification to the facility was incorporated into the above-requested permit alteration. Permit #2667-05 replaced Permit #2667-04.

On May 5, 1995, Plum Creek was issued Permit Modification **#2667-06** to allow for an extension of time for the completion of the NO_X and CO testing on the Riley-Union Stoker boiler. Plum Creek was then required to demonstrate compliance with the NO_X and CO limits on the Riley-Union Stoker boiler by September 22, 1995. The source test was conducted on July 18, 1995.

On July 26, 1995, Permit **#2667-07** was issued to increase the allowable CO emissions from the Riley-Union Stoker boiler from 100 lb/hour to 468 lb/hour. The 100-lb/hour CO limit was based on AIRS Facility Subsystem Emission Factors (AFSEF) emission factors and was later determined to be inappropriate for a 20-year-old boiler. Manufacturers' data and tests on similar boilers suggested that CO emissions from a boiler of this type can range up to 1.6 lb/MMBtu. With a heat input capacity of 292.4 MMBtu/hour, this yielded an hourly emission rate of 468 lb/hr. The allowable CO emissions for the boiler were increased by 1,612 ton/year, but actual CO emissions did not change.

The allowable CO emission increase exceeded significance levels and, therefore, was subject to PSD review. As required by the PSD review process, the appropriate FLMs, as well as the United States Environmental Protection Agency (EPA), were given the opportunity to comment on the proposal. No comments were received from any of the parties. Permit #2667-07 replaced Permit #2667-06.

Permit Modification **#2667-08** was issued by the Department to correct particulate emission limits for the Line 1 MDF Felter #1 & #2 Baghouses. The emission limits were correctly calculated in the permit analysis of Permit #2667-07 as 1.93 lb/hr of particulate, but the emission limit was incorrectly typed as 0.39 lb/hr in the permit. Also, the modification updated the rebuilt plywood facility chip handling process by replacing the Plywood #1 Chip Bin Cyclone and Plywood #2 Chip Bin Cyclone emission limits with a single emission limit for the new Plywood Chip Bin Cyclone; the new emission limit equals the sum of former cyclone emission limits. Formerly, each cyclone had emission limits of 0.65 lb/hr for particulate matter and 0.26 lb/hr for PM_{10}. The new Plywood Chip Bin Cyclone emission limit is 1.30 lb/hr for particulate matter and 0.52 lb/hr for PM_{10}. This change was allowed under the de minimis rule.

In addition, this modification updated the rule citations, removed testing and notification requirements already met by Plum Creek, updated the existing equipment list, and updated the emission inventory by including the sawmill sawdust target box, the plywood fines bin target box, and the drying kilns.

The sawmill sawdust target box had not been included in any permit application, emission inventory, or permit since 2667-M (10/24/91). In Permit #2667-M (10/24/91), the Sawdust Bin Cyclone (sawmill sawdust target box) had allowable PM_{10} emissions of 0.77 lb/hr. Permit #2667-M (1/24/92), included all the cyclones in the sawmill planer process with a PM_{10} emission limit of 12.92 lb/hr; however, the Sawdust Bin Cyclone was no longer listed as a part of the process. Permit #2667-04 assigned individual emission limits to each cyclone. Permit #2667-08 added the sawdust target box and drying kilns to the equipment list and emission inventory, but did not include any emission limits. Permit #2667-08 replaced Permit #2667-07.

A review of the permitting actions demonstrated that the sander baghouse, blow hog, four additional press platens, and the replacement of the two Energex sanderdust burners with one Coen sanderdust burner had not commenced. The sander baghouse, blow hog, and two additional press platens were required to commence construction by July 11, 1997, while the Energex sanderdust burners and 2 additional press platens were required to commence construction by April 17, 1998. A letter dated May 22, 1996, from Mitchell Leu requested that the construction projects be delayed for approximately 2 to 3 years. An alteration to the permit is required for a delay in the commencement of construction of more than 3 years (Administrative Rules of Montana (ARM) 17.8.731). This rule (and

accompanying time period in the permit) would give the Department the opportunity to review the BACT determination to ensure that it is still valid. Thus, if construction on the projects had not commenced by April 17, 1998, Plum Creek would have to request a permit alteration.

On October 8, 1999, Plum Creek submitted a permit application to add a second MDF production line (Line 2) to the Columbia Falls facility. Unlike Line 1 (batch press), the new production line would utilize a continuous press for the production of MDF. Adding Line 2 to the MDF facility would greatly increase the production of MDF and profit from the facility. New limits were added to the permit and new emitting units were added to the emission inventory in the permit analysis.

The addition of Line 2 triggered the PSD rules for CO, NO_X, and ozone (measured as VOC). Because Plum Creek agreed to various limits, the contemporaneous emission changes of particulate matter and PM_{10} were below the PSD significance levels. For this reason, no additional air quality analyses were required for particulate matter and PM_{10}. Plum Creek submitted dispersion modeling that demonstrated that the nitrogen dioxide (NO_2) emissions consume 10.8% (0.27 grams per cubic meter (g/m^3)) of the annual Class I increment and 19.8% (4.96 g/m^3) of the annual Class II increment.

Since this permit was subject to a PSD review, the FLMs and EPA were also given an opportunity to review the application submitted by Plum Creek. Through the course of the FLM review, the NPS requested that Plum Creek revise the regional haze and deposition analyses that were done and repeat the AQRV analysis. In addition, the NPS requested additional information regarding the BACT analysis. Plum Creek submitted the requested information. No comments were received from EPA or any other FLMs.

The Department received comments on the PD from the NPS on December 1, 1999, and from Plum Creek on December 2, 1999. All comments received on the PD were addressed in the permit, as the Department deemed appropriate. Permit **#2667-09** replaced Permit #2667-08.

On April 23, 2001, Plum Creek submitted an application for an alteration in the design of the Line 2 MDF dryer emissions control equipment. The ESP would be replaced by two venturi scrubbers operating in series with a bio-filter system.

The addition of Line 2 triggered PSD review for CO, NO_X, and ozone (measured as VOC). Plum Creek is not subject to the NSR nonattainment area permitting requirements for this permitting action.

Since the BACT determination had changed since the initial issuance of Permit #2667-09 for the second MDF line, the FLMs and EPA were given an opportunity to review the application submitted by Plum Creek. The change in the BACT would cause the emission dispersion characteristics of the stacks to change, although the emission limits for the Line 2 MDF dryers would remain the same.

In addition to changing the emission controls for the second line, Plum Creek made minor changes to several cyclones and baghouses on the existing and proposed MDF lines. The sizes and locations of some of the Line 2 baghouses changed in the new design. Two cyclones were removed from the existing MDF line, and some of the baghouse names were changed. The emission inventory reflected the change in flow rates based on the volume of cooling air introduced into the bio-filter system.

Due to the dryer stack dispersion characteristics and the baghouses, Plum Creek submitted a revised PM_{10} compliance demonstration with this application. The modeling shows that the second line MDF project would not cause or contribute to a violation of the Montana Ambient Air Quality Standards (MAAQS). Permit **#2667-10** replaced Permit #2667-09.

On December 5, 2001, Plum Creek submitted a New Source Review (NSR)/PSD application for three historical projects at the Columbia Falls facility. During an independent compliance awareness review performed in 2000, Plum Creek discovered that the 1989 MDF Coen Burner Project, the 1990 MDF Line Speed Up Project, and the 1992 MDF Heating and Humidification Project should have gone through PSD permitting prior to the projects being constructed and/or implemented. Based on the PSD Significant Emission Rates (SERs), the 1989 MDF Coen Burner Project would have been subject to PSD permitting for CO and NO_X; the 1990 MDF Line Speed Up Project, for particulate matter (PM), PM_{10}, and VOC; and the 1992 MDF Heating and Humidification Project, for PM, PM_{10}, and VOC. As the Columbia Falls area (including the Plum Creek facility) was designated as a nonattainment area for PM_{10} by the EPA on November 15, 1990, the 1992 project would have triggered nonattainment area NSR permitting for PM_{10}. This permitting action addresses the PSD permitting, as well as the nonattainment area NSR permitting, which should have occurred prior to construction/implementation of the above-mentioned projects.

In addition, on November 19, 2002, the Department received a request from Plum Creek to remove the requirement limiting the MDF Line 2 equipment to 8760 hours per year. As there are only 8760 hours in a year, this requirement was not necessary and was removed.

In response to further research by the Department and comments received in the PD of Permit #2667-11, the discussion regarding Low NO_X Burners as a BACT option for NO_X control was revised. In addition, Section II.L of Permit #2667-11's PD was eliminated, as the emissions from the Coen Burner were already incorporated into the Line 1 MDF limitations and conditions. Line 1 MDF (including the Coen Burner) was currently tested as one emission point on an every 3-year basis. The BACT requirement for good combustion practices did not change the overall potential to emit, which was the basis for the original Coen Burner NO_X and CO limits placed in the PD of Permit #2667-11. Permit **#2667-11** replaced Permit #2667-10.

D. Current Permit Action

On October 18, 2004, Plum Creek submitted a complete Montana Air Quality Permit application to the Montana Department for the addition of a 1993 Babcock and Wilcox 96.4-MMBtu/hr (75,000 lb/hr) boiler to be fired on natural gas and diesel fuel. Plum Creek also plans to remove the 22,000 lb/hr CE Boiler and the 20,000 lb/hr Plywood Boiler. The current permitting action adds the 1993 Babcock and Wilcox 96.4-MMBtu/hr (75,000 lb/hr) boiler and updates the permit to reflect current permit language and rule references used by the Department. Permit **#2667-12** replaces Permit #2667-11.

E. Additional Information

Additional information, such as applicable rules and regulations, BACT/Reasonable Available Control Technology (RACT) determinations, air quality impacts, and

environmental assessments, is included in the analysis associated with each change to the permit.

II. Applicable Rules and Regulations

The following are partial quotations of some applicable rules and regulations that apply to the facility. The complete rules are stated in the ARM and are available upon request from the Department. Upon request, the Department will provide references for locations of complete copies of all applicable rules and regulations or copies where appropriate.

A. ARM 17.8 Subchapter 1 – General Provisions, including, but not limited to:

1. ARM 17.8.101 Definitions. This rule includes a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.105 Testing Requirements. Any person or persons responsible for the emissions of any air contaminant into the outdoor atmosphere shall, upon written request of the Department, provide the facilities and necessary equipment, including instruments and sensing devices, and shall conduct tests, emission or ambient, for such periods of time as may be necessary using methods approved by the Department.

3. ARM 17.8.106 Source Testing Protocol. The requirements of this rule apply to any emission source testing conducted by the Department, any source, or other entity as required by any rule in this chapter, or any permit or order issued pursuant to this chapter, or the provisions of the Clean Air Act of Montana, 75-2-101, *et seq*., Montana Code Annotated (MCA).

   Plum Creek shall comply with the requirements contained in the Montana Source Test Protocol and Procedures Manual, including, but not limited to, using the proper test methods and supplying the required reports. A copy of the Montana Source Test Protocol and Procedures Manual is available from the Department upon request.

4. ARM 17.8.110 Malfunctions. (2) The Department must be notified promptly by telephone whenever a malfunction occurs that can be expected to create emissions in excess of any applicable emission limitation, or to continue for a period greater than 4 hours.

5. ARM 17.8.111 Circumvention. (1) No person shall cause or permit the installation or use of any device or any means that, without resulting in reduction in the total amount of air contaminant emitted, conceals or dilutes an emission of air contaminant that would otherwise violate an air pollution control regulation. (2) No equipment that may produce emissions shall be operated or maintained in such a manner that a public nuisance is created.

B. ARM 17.8, Subchapter 2 – Ambient Air Quality, including, but not limited to:

1. ARM 17.8.210 Ambient Air Quality Standards for Sulfur Dioxide
2. ARM 17.8.211 Ambient Air Quality Standards for Nitrogen Dioxide
3. ARM 17.8.212 Ambient Air Quality Standards for Carbon Monoxide
4. ARM 17.8.213 Ambient Air Quality Standard for Ozone
5. ARM 17.8.214 Ambient Air Quality Standard for Hydrogen Sulfide

6. ARM 17.8.220 Ambient Air Quality Standard for Settled Particulate Matter
7. ARM 17.8.221, Ambient Air Quality Standard for Visibility
8. ARM 17.8.222 Ambient Air Quality Standard for Lead
9. ARM 17.8.223 Ambient Air Quality Standard for PM_{10}
10. ARM 17.8.230 Fluoride in Forage

Plum Creek must maintain compliance with the applicable ambient air quality standards.

C. ARM 17.8, Subchapter 3 – Emission Standards, including, but not limited to:

1. ARM 17.8.304 Visible Air Contaminants. This rule requires that no person may cause or authorize emissions to be discharged into the outdoor atmosphere from any source installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes.

2. ARM 17.8.308 Particulate Matter, Airborne. (1) This rule requires an opacity limitation of less than 20% for all fugitive emission sources and that reasonable precautions be taken to control emissions of airborne particulate matter. (2) Under this rule, Plum Creek shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter. (4) This rule requires reasonable precautions for fugitive emission sources and RACT for existing fugitive emission sources located in a nonattainment area. The Department, in consultation with EPA, determined that the use of chemical stabilization on major haul roads and on working areas within the log decks, in conjunction with watering, will satisfy these requirements.

3. ARM 17.8.309 Particulate Matter, Fuel Burning Equipment. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere, particulate matter caused by the combustion of fuel in excess of the amount determined by this rule.

4. ARM 17.8.310 Particulate Matter, Industrial Process. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere, particulate matter in excess of the amount set forth in this rule.

5. ARM 17.8.322 Sulfur Oxide Emissions--Sulfur in Fuel. Commencing July 1, 1972, no person shall burn any gaseous fuel containing sulfur compounds in excess of 50 grains per 100 cubic feet of gaseous fuel, calculated as hydrogen sulfide at standard conditions.

6. ARM 17.8.324 Hydrocarbon Emissions--Petroleum Products. (3) No person shall load or permit the loading of gasoline into any stationary tank with a capacity of 250 gallons or more from any tank truck or trailer, except through a permanent submerged fill pipe, unless such a tank is equipped with a vapor loss control device as described in (1) of this rule.

7. ARM 17.8.340 Standard of Performance for New Stationary Sources. This rule incorporates, by reference, 40 Code of Federal Regulations (CFR) Part 60, Standards of Performance for New Stationary Sources (NSPS). This facility is not an NSPS affected source because it does not meet the definition of any NSPS subpart defined in 40 CFR Part 60. There are no NSPS requirements for plywood plants or MDF plants.

40 CFR Part 60, Subpart D, Standard of Performance for fossil-fuel-fired steam generators does not apply to the Riley-Union Stoker wood-fired steam boiler because it does not have the capabilities of firing fossil fuel at a heat input rate of more than 250 million Btu per hour.

40 CFR Part 60, Subpart Db, Standard of Performance for Small Industrial-Commercial-Institutional Steam Generating Units does not apply to the Riley-Union Stoker wood-fired steam boiler because it was not constructed, reconstructed, or modified after June 19, 1984. The Riley-Union Stoker wood-fired steam boiler was fabricated in 1973.

40 CFR Part 60, Subpart Dc, Standard of Performance for Small Industrial-Commercial-Institutional Steam Generating Units applies to the Plum Creek – Columbia Falls facility 96.4-MMBtu/hr natural gas/diesel fired boiler because the boiler was constructed after to June 9, 1989.

8. ARM 17.8.342 Emission Standards for Hazardous Air Pollutants for Source Categories. The source, as defined and applied in 40 CFR Part 63, shall comply with the requirements of 40 CFR Part 63, as listed below:

Subpart A - General Provisions applies to all NESHAP source categories subject to a Subpart as listed below.

Subpart DDDDD – Industrial Boilers and Process Heaters shall apply to, as applicable, but not limited to, the96.4-MMBtu/hr Natural Gas/Diesel Boiler.

D. ARM 17.8. Subchapter 5 – Air Quality Permit Application, Operation, and Open Burning Fees, including, but not limited to:

1. ARM 17.8.504 Air Quality Permit Application Fees. This rule requires that an applicant submit an air quality permit application fee concurrent with the submittal of an air quality permit application. A permit application is incomplete until the proper application fee is paid to the Department. Plum Creek submitted the appropriate fee for the current permitting action.

2. ARM 17.8.505 Air Quality Operation Fees. An annual air quality operation fee must, as a condition of continued operation, be submitted to the Department by each source of air contaminants holding an air quality permit, excluding an open burning permit, issued by the Department. The air quality operation fee is based on the actual or estimated actual amount of air pollutants emitted during the previous calendar year.

An air quality operation fee is separate and distinct from an air quality permit application fee. The annual assessment and collection of the air quality operation fee, as described above, shall take place on a calendar-year basis. The Department may insert into any final permit issued after the effective date of these rules such conditions as may be necessary to require the payment of an air quality operation fee on a calendar-year basis, including provisions that pro-rate the required fee amount.

E. ARM 17.8, Subchapter 7 – Permit, Construction, and Operation of Air Contaminant Sources, including, but not limited to:

1. ARM 17.8.740 Definitions. This rule is a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.743 Montana Air Quality Permits--When Required. This rule requires a person to obtain an air quality permit or permit alteration to construct, alter or use any air contaminant sources that have the Potential to Emit (PTE) greater than 25 tons per year of any pollutant. Plum Creek has a PTE greater than 25 tons per year of PM, PM_{10}, NO_X, CO, and VOC; therefore, an air quality permit is required.

3. ARM 17.8.744 Montana Air Quality Permits--General Exclusions. This rule identifies the activities that are not subject to the Montana Air Quality Permit program.

4. ARM 17.8.745 Montana Air Quality Permits--Exclusion for De Minimis Changes. This rule identifies the de minimis changes at permitted facilities that do not require a permit under the Montana Air Quality Permit Program.

5. ARM 17.8.748 New or Modified Emitting Units--Permit Application Requirements. (1) This rule requires that a permit application be submitted prior to installation, alteration or use of a source. Plum Creek submitted the required permit application for the current permit action. (7) This rule requires that the applicant notify the public by means of legal publication in a newspaper of general circulation in the area affected by the application for a permit. Plum Creek submitted an affidavit of publication of public notice for the September 26, 2004, issue of the *Daily Inter Lake*, a newspaper of general circulation in the Town of Columbia Falls in Flathead County, as proof of compliance with the public notice requirements.

6. ARM 17.8.749 Conditions for Issuance or Denial of Permit. This rule requires that the permits issued by the Department must authorize the construction and operation of the facility or emitting unit subject to the conditions in the permit and the requirements of this subchapter. This rule also requires that the permit must contain any conditions necessary to assure compliance with the Federal Clean Air Act (FCAA), the Clean Air Act of Montana, and rules adopted under those acts.

7. ARM 17.8.752 Emission Control Requirements. This rule requires a source to install the maximum air pollution control capability that is technically practicable and economically feasible, except that BACT shall be utilized. The required BACT analysis is included in Section III of this permit analysis.

8. ARM 17.8.755 Inspection of Permit. This rule requires that air quality permits shall be made available for inspection by the Department at the location of the source.

9. ARM 17.8.756 Compliance with Other Requirements. This rule states that nothing in the permit shall be construed as relieving Plum Creek of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq*.

10. ARM 17.8.759 Review of Permit Applications. This rule describes the Department's responsibilities for processing permit applications and making permit decisions on those permit applications that do not require the preparation of an environmental impact statement.

11. ARM 17.8.762 Duration of Permit. An air quality permit shall be valid until revoked or modified, as provided in this subchapter, except that a permit issued prior to construction of a new or altered source may contain a condition providing that the permit will expire unless construction is commenced within the time specified in the permit, which in no event may be less than 1 year after the permit is issued.

12. ARM 17.8.763 Revocation of Permit. An air quality permit may be revoked upon written request of the permittee, or for violations of any requirement of the Clean Air Act of Montana, rules adopted under the Clean Air Act of Montana, the FCAA, rules adopted under the FCAA, or any applicable requirement contained in the SIP.

13. ARM 17.8.764 Administrative Amendment to Permit. An air quality permit may be amended for changes in any applicable rules and standards adopted by the Board of Environmental Review (Board) or changed conditions of operation at a source or stack that do not result in an increase of emissions as a result of those changed conditions. The owner or operator of a facility may not increase the facility's emissions beyond permit limits unless the increase meets the criteria in ARM 17.8.745 for a de minimis change not requiring a permit, or unless the owner or operator applies for and receives another permit in accordance with ARM 17.8.748, ARM 17.8.749, ARM 17.8.752, ARM 17.8.755, and ARM 17.8.756, and with all applicable requirements in ARM Title 17, Chapter 8, Subchapters 8, 9, and 10.

14. ARM 17.8.765 Transfer of Permit. This rule states that an air quality permit may be transferred from one person to another if written notice of Intent to Transfer, including the names of the transferor and the transferee, is sent to the Department.

F. ARM 17.8, Subchapter 8 – Prevention of Significant Deterioration of Air Quality, including, but not limited to:

1. ARM 17.8.801 Definitions. This rule is a list of applicable definitions used in this subchapter.

2. ARM 17.8.818 Review of Major Stationary Sources and Major Modifications – Source Applicability and Exemptions. The requirements contained in ARM 17.8.819 through 17.8.827 shall apply to any major stationary source and any major modification with respect to each pollutant subject to regulation under the FCAA that it would emit, except as this subchapter would otherwise allow.

3. ARM 17.8.822 Air Quality Analysis. This rule requires a major stationary source to supply an analysis of the ambient air quality in the area that the emissions from the major stationary source or major modification would affect. This rule further requires that the analysis shall contain air quality monitoring data for any pollutant that may be emitted in a significant amount and for which no ambient air quality standard exists. An air quality analysis was performed and is described in Section VI of this permit analysis.

Plum Creek's Columbia Falls Facility is not a listed source, but it is defined as a "major stationary source" since it has the potential to emit more than 250 tons per year of any pollutant. The current permit action is subject to PSD review based on the following information:

1989 MDF Coen Burner Project

Pollutant	Total Change in Emissions (tons/year)	PSD SERs (tons/year)	Is Change Above SER?
CO	120.1	100	Yes
NO_X	61.1	40	Yes
SO_2	1.6	40	No

1990 MDF Production Line Speedup Project

Pollutant	Total Change in Emissions (tons/year)	PSD SERs (tons/year)	Is Change Above SER?
PM_{10}	50.0	15	Yes
PM	58.1	25	Yes
CO	40.8	100	No
NO_X	22.6	40	No
SO_2	0.5	40	No
VOC	57.5	40	Yes
Lead	4.3E-06	0.6	No

1992 MDF Heating and Humidification Project

Pollutant	Total Change in Emissions (tons/year)	PSD SERs (tons/year)	Is Change Above SER?
PM_{10}	47.0	15	Yes
PM	55.5	25	Yes
CO	32.2	100	No
NO_X	17.5	40	No
SO_2	0.4	40	No
VOC	49.5	40	Yes
Lead	5.0E-06	0.6	No

Therefore, the 1989 MDF Coen Burner Project would have been subject to PSD for CO and NO_X; the 1990 MDF Line Speed Up Project, for PM, PM_{10}, and VOC; and the 1992 MDF Heating and Humidification Project, for PM, PM_{10}, and VOC. The PSD applicability and associated permitting process are addressed in this permitting action.

G. ARM 17.8, Subchapter 9 – Permit Requirements for Major Stationary Sources or Major Modifications Locating within Nonattainment Areas, including, but not limited to:

ARM 17.8.906 Baseline for Determining Credit for Emissions and Air Quality Offsets. (1) This rule specifies that emission offsets in nonattainment areas are required to be in the form of, and against, actual emissions. (2) Where the emission limitation under the SIP allows greater emissions than the actual emissions of the source, emission offset credit will be allowed only for control below the actual emissions. (6) All emission reductions claimed as offset credit shall be federally enforceable. (7) Emission offsets may only be obtained from the same source or other sources in the same nonattainment area. (9) In the case of emission offsets involving sulfur dioxide, particulates, and carbon monoxide, area-wide mass emission offsets are not acceptable and the applicant shall perform atmospheric simulation modeling to ensure that the emission offsets provide a positive net air quality benefit. However, the Department may exempt the applicant from

the atmospheric simulation modeling requirement if the emission offsets provide a positive net air quality benefit, are obtained from an existing source on the same premises or in the immediate vicinity of the new source, and the pollutants disperse from substantially the same effective stack height. The Department hereby exempts Plum Creek from these modeling requirements. (10) Credits for an emission reduction can be claimed to the extent that the Department has not relied on it in issuing any air quality preconstruction permit under Subchapters 7, 8, 9 and 10, or Montana has not relied on it in a demonstration of attainment or reasonable further progress.

The 1992 MDF Heating and Humidification Project would have been subject to NSR Nonattainment Area permitting had it been permitted prior to implementation. As this permit action acts to ensure compliance with the applicable NSR/PSD requirements looking back at this project, offsets have been required as a part of this action. The 1992 MDF Heating and Humidification Project incurred 47.0 tons of actual PM_{10} emissions on an annual basis. According to ARM 17.8.905, emission reductions (offsets) obtained must provide both a positive net air quality benefit in the affected area and a ratio of 1:1 or greater with respect to the proposed emission increases. Therefore, at least 47.0 tons of PM_{10} offsets must be obtained for this project to comply with ARM 17.8, Subchapter 9.

As actual PM_{10} emissions from the Plum Creek Columbia Falls facility have decreased in excess of 250 tons from 1992 to 2001, and are expected to continue to decrease based on emission controls installed on new projects, the offsets were found from existing actual emissions reductions at Plum Creek. Of those reductions, 30.6 tons per year of PM_{10} reductions had already been made federally enforceable in Permit #2667-09 and 10 tons per year in Permit #2667-10, both associated with the Line 2 MDF project. Both analyses for contemporaneous emission changes associated with those permits can be found in the respective permit applications. Preliminary actual emissions data from the Line 2 MDF project show that emission reductions will exceed those cited reductions. In addition, actual emission reductions were made federally enforceable by the decrease of the emission limit on the Riley-Union Stoker Boiler from 8.77 lb/hr to 6.94 lb/hr of PM_{10} (for a total of 8.0 tons per year). The total offsets accounted for total 48.6 tons per year, exceeding the necessary 47.0 tons per year.

H. ARM 17.8, Subchapter 12 – Operating Permit Program Applicability, including, but not limited to:

1. ARM 17.8.1201 Definitions. (23) Major Source under Section 7412 of the FCAA is defined as any stationary source having:

   a. PTE > 100 tons/year of any pollutant;

   b. PTE > 10 tons/year of any one Hazardous Air Pollutant (HAP), PTE > 25 tons/year of a combination of all HAPs, or lesser quantity as the Department may establish by rule; or

   c. PTE > 70 tons/year of PM_{10} in a serious PM_{10} nonattainment area.

2. ARM 17.8.1204 Air Quality Operating Permit Program. (1) Title V of the FCAA amendments of 1990 requires that all sources, as defined in ARM 17.8.1204(1), obtain a Title V Operating Permit. In reviewing and issuing Air Quality Permit #2667-12 for Plum Creek, the following conclusions were made:

a. The facility's PTE is greater than 100 tons/year for PM_{10}, NO_X, CO and VOC.

b. The facility's PTE is greater than 10 tons/year for any one HAP and greater than 25 tons/year for all HAPs.

c. This source is not located in a serious PM_{10} nonattainment area.

d. This facility is subject to a current NSPS (Subpart Dc).

e. This facility is not subject to any current NESHAP standards.

f. This source is not a Title IV affected source, nor a solid waste combustion unit.

g. This source is not an EPA designated Title V source.

Based on these facts, the Department determined that Plum Creek is subject to the Title V operating permit program. Plum Creek was issued a Title V operating permit (OP2667-00) on January 14, 1999.

III. BACT Determination

A BACT determination is required for each new or altered source. Plum Creek shall install on the new or altered source the maximum air pollution control capability, which is technically practicable and economically feasible, except that BACT shall be utilized.

Plum Creek submitted a BACT analysis in Permit Application #2677-12, addressing some available methods of controlling NO_X, CO, VOC, PM, and SO_2 emissions from the 96.4-MMBtu/hr natural gas/diesel fired boiler. The Department reviewed these methods, as well as previous BACT determinations. The Department has reviewed the following control options in order to make the following BACT determination.

The control options selected have controls and control costs comparable to other recently permitted similar sources and are capable of achieving the appropriate emission standards.

A. NO_X

1. Identify All Control Technologies

Identify all available control options for the emissions unit in question. Control options are those air pollution control technologies or techniques with a practical potential for application to the emissions unit and regulated pollutant being evaluated. The following categories of technologies are addressed in identifying candidate control alternatives:

Demonstrated add-on control technologies applied to the same emissions unit at other similar source types;

Add-on controls not demonstrated for the source category in question but transferred from other source categories with similar emission stream characteristics;
Process controls such as combustion or alternative production processes;

Add-on control devices serving multiple emission units in parallel; and

Equipment or work practices, especially for fugitive or area emission sources where add-on controls are not feasible.

There are three mechanisms for NO_X formation: thermal NO_X, prompt NO_X, and fuel-bound NO_X. Thermal NO_X formation occurs by the high temperature dissociation and subsequent reaction of combustion air molecular nitrogen (N_2) and oxygen (O_2), via the Zeldovich mechanism. Much of the NO_X resulting from the thermal NO_X mechanism is generated in the high temperature zone near the burner and is affected by O_2 concentration, peak temperature, and the time of exposure at peak temperature. Thermal NO_X generation increases exponentially with temperature, and above 2000 degrees Fahrenheit, it is generally the predominant mechanism in combustion processes that involve fuel streams that do not contain significant amounts of chemically bound nitrogen, such as natural gas. Prompt NO_X occurs at the flame front through the relatively fast reaction between N_2 and O_2 molecules in the combustion air and fuel hydrocarbon radicals that are intermediate species formed during the combustion process. Because it is an important mechanism in lower temperature combustion processes, it can represent a significant portion of NO_X emissions when emissions are reduced to extremely low levels associated with typical NO_X combustion control techniques. Fuel-bound NO_X is formed by the direct oxidation of organo-nitrogen compounds contained in the fuel stream. Gaseous fuels such as natural gas typically contain negligible fuel bound nitrogen concentrations.

The table below describes the potential BACT control options used to control NO_X emissions from the boiler.

Boiler BACT Control	
Rank	**Control Technology**
1	SCR
2	SNCR
3	FGR/LNB
4	Proposed Burner

a. Selective Catalytic Reduction (SCR)

The top ranked control alternative considered is SCR. SCR is a post-combustion flue gas treatment technique for the selective catalytic chemical reduction of nitric oxide (NO) and nitrogen dioxide (NO_2) to molecular nitrogen and water vapor. In the SCR process, a reducing agent, ammonia (NH_3), is mixed with the combustion device exhaust stream and then passed through a catalyst bed, which serves to lower the activation energies necessary for the NO_X reduction reactions to occur and to increase the NO_X reduction reactions rates. The NO_X and NH_3 are adsorbed onto the catalyst surface to form an activated complex and then catalytic reaction occurs resulting in nitrogen and water, which are desorbed from the catalyst surface and into the flue gas.

b. Selective Non-Catalytic Reduction (SNCR)

The second most stringent alternative considered is SNCR. The SNCR process is similar to the SCR process in that a reagent reacts with NO_X to form nitrogen and water vapor. The difference between the two processes is that, SNCR does not utilize a catalyst to promote the chemical reduction of NO_X. The most common reagents used in SNCR systems are injected into the flue gas stream within a specific temperature window to ensure optimum reduction of NO_X. The SNCR process requires extremely high flue gas temperatures to disassociate NO_X to nitrogen and water vapor.

c. Flue Gas Recirculation/ Low NO_X Burners (FGR/LNB)

The third most stringent control alternative considered is FGR/LNB technology. NO_X reduction combustion control equipment and techniques consist of a range of designs and performance levels, which are dependant on the type of fuel fired in the combustion unit and the function of the combustion source. FGR/LNB utilize the stage fuel concept and either inspirate flue gases from the radiant section into the primary and secondary combustion reaction zones or utilize external flue gas recirculation, both of which serve to rapidly mix the fuel and air near the burner exit while controlling flame temperature. The rapid fuel and air mixing nearly eliminates the formation of prompt NO_X and also virtually eliminates incomplete combustion pollutants, while the flue gas recirculation minimizes the generation of thermal NO_X by limiting the peak flame temperature due to lower overall excess oxygen concentration.

d. The fourth alternative is the proposed burner that does not include the addition of any control technology.

2. Eliminate Technically Infeasible Options

The technical feasibility of the control options identified above is evaluated with respect to the source-specific factors. A demonstration of technical infeasibility should be clearly documented and shown, based on physical, chemical, and/or engineering principles. If options are eliminated in this step, the analysis should show technical difficulties would preclude the successful use of the control options on the emissions unit under review. Technically infeasible control options may then be eliminated from further consideration. The following criteria are considered in determining technical feasibility: previous commercial scale demonstrations, precedents based on previous permits, and technology transfer from similar sources. For the purposes of this analysis, all control options are considered feasible.

3. Rank Remaining Technologies by Control Effectiveness

Below is an assessment and documentation of the emissions reductions achievable with each technically feasible alternative. Available control technology options deemed technically feasible from above are ranked in order of pollutant removal effectiveness. The control option that results in the highest

pollution removal value is considered the top control alternative.

Boiler BACT Control		
Rank	**Control Technology**	**Reduction (%)**
1	SCR	75
2	SNCR	50
3	FGR/LNB	35
4	Proposed Burner	--

4. Evaluate Most Effective Controls and Document Results

After the identification of available and technically feasible control technology options, the energy, environmental, and economic impacts are considered. To reject the top alternative, it must be demonstrated that this control alternative is infeasible based on the impacts analysis results. If a control technology is determined to be technically infeasible or infeasible based on high cost effectiveness, or to cause adverse energy or environmental impacts, the control technology is rejected and the impacts analysis is performed on the next most stringent control alternative. This process continues until the technology under consideration cannot be eliminated by any source-specific environmental, energy, or economic impacts which demonstrate that alternative to be inappropriate as BACT.

a. SCR

Technical difficulties associated with SCR systems include the temperature of the flue gas stream that is critical in the design and operation of an SCR unit because a specific type of catalyst must be chosen to ensure optimum NO_X reduction. If the temperature of the flue gas drops below the optimum operating window of the selected catalyst, then the NO_X reduction of the SCR system will decrease and the quantity of ammonia reagent emitted will increase. If the temperature of the flue gas rises above the optimum operating window of the catalyst, then the ammonia reagent can be oxidized and generate additional NO_X. Any fuel that contains an appreciable level of sulfur compounds, there are significant concerns with regards to maintaining the correct SCR operating conditions that will not generate ammonium salts that are formed as byproducts in undesirable side reactions and that can cause plugging when they accumulate on the catalyst surface or corrosion of downstream equipment on which they may condense. The salts can be generated when the SCR operating temperature is too low because NH_3 that does not react with NO_X is available to react with SO_3. There are several steps that can be taken to reduce the potential for plugging however, associated with these options are additional operating parameters that must be maintained over a variety of combustion unit operating loads and conditions. If necessary, additional operating costs would be required to remove the sulfur content in the fuel gas and to provide supplemental heat to ensure and SCR temperature above the dew point of the ammonium salts.

Environmental and safety concerns associated with the operation of an SCR system include, the operation of the SCR with a molar NH_3/NO_X ratio greater than that required by stoichiometry of the reduction

chemical reaction in order to achieve optimal NO_X reduction, referred to as ammonia slip and it results in the emission of odorous NH_3 into the atmosphere and can react with ambient air to generate fine particulate matter that scatters light and may result in regional visibility problems, the formation of ammonium salts which can cause visible plumes and elevated opacity readings from the stack, the depleted catalyst may be considered hazardous waste, and safety considerations associated with the transportation, storage, and handling of large amounts of anhydrous ammonia.

The most stringent alternative considered for the control of NO_X emissions is SCR without the combination of combustion controls. There are adverse technical, environmental, and safety issues, discussed in above for SCR, associated with the installation and operation of SCR systems for combustion sources firing natural gas that counter SCR selection as BACT. The table below documents the cost effectiveness of an SCR system.

SCR Cost Effectiveness				
Source	**Initial Capital Expenditure ($)**	**Annual Operating Cost ($)**	**NO_X Reduction (tpy)**	**Cost Effectiveness ($/ton)**
96.4 MMBtu/hr Boiler	3,460,000	641,540	22.1	29,029

Because of the technical difficulties, environmental concerns, safety issues, and the high annual costs associated with the operation of an SCR unit when compared to the proposed burners the SCR control technology alternative was rejected as BACT.

b. SNCR

Average 1992 SNCR operating cost were $0.20/MMBtu according to the Institute of Clean Air Companies, Inc. White Paper on SNCR. The EPA control cost manual provides methodology for SNCR determining cost, much of which is not applicable in this small application. Therefore, the cost analysis will rely on the ICAC information, adjusted to 2004 dollars at an inflation rate of 5% per year. There are two major issues regarding SNCR: temperature and particulate. In order to derive the reaction, an operating temperature between 1,600 and 2,000 degree Fahrenheit is necessary. If the temperature falls below this range, the ammonia will not react with the NO. Ammonia passes directly to the atmosphere along with NO. If the temperature is too high, the ammonia oxidizes directly to NO_X and increases the uncontrolled emissions of NO_X. The anticipated exit temperature where the SNCR device would be placed is approximately 600 degrees Fahrenheit. To allow the reaction to occur, the gases must be reheated using an afterburner or similar device. This action combusts more fuel and drives up the NO_X levels into the scrubber and into the atmosphere. The additional cost of both fuel consumption and capital expenditures has not been include in the table below.

SNCR Cost Effectiveness				
Source	**Initial Capital Expenditure ($)**	**Annual Operating Cost ($)**	**NO_X Reduction (tpy)**	**Cost Effectiveness ($/ton)**

96.4 MMBtu/hr Boiler	445,000	383,100	14.7	26,061

c. FGR/LNB

Information for this section has been provided from Coen Company, Inc. case history describing FGR/LNB retrofit of a Babcock and Wilcox boiler of the same size and fuel type. Estimated 1993 capital cost was $10,000 for the FGR fan motor and ductwork, FGR valve, windbox inlet, and associated installation labor. In 2004 dollars, at 5% inflation rate, the capital cost is estimated to be $17,100. The FGR capital cost annualized is over a 10-year period at 12% rate of return for the control cost evaluation.

Annual operating costs for FGR horsepower and the annual operating cost due to boiler efficiency reduction due to FGR were reported as $44,000 per year based on 1993 costs. Adjusting for inflation, the annual additional operating cost is calculated to be $75,300 per year. Total annualized cost of FGR/LNB is $78,300 per year.

FGR/LNB Cost Effectiveness				
Source	**Initial Capital Expenditure ($)**	**Annual Operating Cost ($)**	**NO_X Reduction (tpy)**	**Cost Effectiveness ($/ton)**
96.4 MMBtu/hr Boiler	17,000	78,300	10.3	7,602

5. Select BACT

A boiler equipped with SNCR control technology is the most effective method to control NO_X emissions; a boiler equipped with SCR control technology is the second most effective method to control NO_X emissions; and a boiler equipped with FGR/LNB control technology is the third most effective method to control NO_X emissions. The cost per ton of NO_X removed for each of these control technologies is $29,029, $26,061, and $7,602 respectively, are above industry norms for add-on control technology.

Because the proposed burners have fewer technical difficulties, safety issues, and do not have the high annual costs associated with the operation of SCR control technology, SNCR control technology, or FGR/LNB technology, the proposed burners alternative and an emission limit of 6.75 lb/hr (0.07 lb/MMBtu) constitutes BACT.

B. CO

Current burner design has reduced the inverse relationship between the conditions that contribute to CO formation but result in lower emission of NO_X. The rate of CO emissions from boilers depends on the efficiency of fuel combustion. Improperly tuned boilers and boilers operating at off-design levels decrease combustion efficiency resulting in increased CO emissions. Plum Creek's proposal to burn pipeline quality natural gas and utilize good combustion practices and engineering design to comply with a CO emission limit of 7.91 lb/hr (0.082 lb/MMBtu) constitutes BACT.

C. VOC

VOC emissions are generated from incomplete combustion of natural gas or diesel fuel. The rate of VOC emissions from boilers and furnaces depends on combustion efficiency. VOC emissions are minimized by combustion practices that promote high combustion

temperatures, long residence times at those temperatures, and turbulent mixing of fuel and combustion air. Trace amounts of VOC species in the natural gas may also contribute to VOC emissions if they are not completely combusted in the boiler. Plum Creek's proposal to burn pipeline quality natural gas and utilize good combustion practices and engineering design constitutes BACT.

D. PM/PM_{10}

VOC emissions are generated from incomplete combustion of natural gas or diesel fuel. PM emissions from natural gas boilers are typically low because natural gas is a gaseous fuel. Particulate matter from natural gas combustion has been estimated to be less than 1 micrometer in size and has filterable and condensable fractions. Increase in particulate matter emissions may result from poor air/fuel mixing or maintenance problems. Filterable particulate emissions depend on the completeness of combustion as well as on the oil ash content. The particulate emitted by distillate oil-fired boilers consists primarily of carbonaceous particles resulting from incomplete combustion of oil and is not correlated to as or sulfur content of the oil. Plum Creek's proposal to burn pipeline quality natural gas and utilize good combustion practices and engineering design constitutes BACT.

E. SO_2

SO_2 emissions from fuel burning equipment are directly related to the amount of sulfur content of the fuel and, the best control for SO2 is to prevent its formation during combustion. Emissions of SO_2 from natural gas-fired boilers are low because pipeline quality natural gas typically has sulfur levels of 2,000 grains per million cubic feet. Plum Creek's proposal to burn pipeline quality natural gas and utilize good combustion practices and engineering design constitutes BACT.

IV. Emission Inventory--Criteria Pollutants

A. Allowable Emission Inventory for Permit #2667-12

Source	TSP	PM_{10}	NO_X	VOC	CO	SO_X
Riley -Union Stoker Boiler	38.4	30.4	589.13	19.71	2049.00	16.43
Veneer Dryer	43.80	43.80		25.75		
Line 1 MDF ADS Baghouse	8.04	8.04				
Line 1 MDF Fiber Dryers	98.36	98.36	281.56	557.18	361.25	1.99
Planer #3 Cyclone	24.33	9.73				
Planer #4 Cyclone	60.82	24.33				
Planer Shavings Bin Cyclone	6.08	2.43				
Planer Chip Bin Cyclone	6.08	2.43				
Sawmill Chip Bin Cyclone	6.08	2.43				
Sawmill Sawdust Target Box	2.15	1.07				
Sawmill Drying Kilns	18.65	18.65		158.49		
Plywood Chip Bin Cyclone	5.69	2.28				
Plywood Fines Target Box	5.69	2.28				
Plywood Sander Dust Baghouse	5.91	5.91				
Plywood 18" Hog Baghouse	2.53	2.53				
Plywood 30" Hog Baghouse	2.53	2.53				
Plywood Fines Bin Target Box	5.69	2.28				
Line 1 MDF N. Sander Baghouse #7	9.01	9.01				
Line 1 MDF S. Sander Baghouse #8	9.01	9.01				
Line 1 MDF Board Trim Baghouse #10	0.52	0.52				
Line 1 MDF Sanderdust Fuel Baghouse	0.67	0.67				
Line 1 MDF Booksaw Baghouse #5	8.19	8.19				
Line 1 MDF Sander Hog Baghouse #6	8.19	8.19				
Line 1 MDF Metering Bin Baghouse #1	8.19	8.19				
Line 1 MDF Felter Baghouse #1	8.19	8.19				
Line 1 MDF Felter Baghouse #2	8.19	8.19				
Line 1 MDF Blr Sndrdst BH#11	3.56	3.56				
Line 1 MDF Forming and Finishing	109.65	40.38		56.95		
Line 2 MDF Fiber Dryers	78.8	78.8	190.2	333.0	316.0	3.49
Line 2 MDF Press	14.1	14.1		8.76		
Line 2 MDF North Sander Baghouse	9.37	9.37				
Line 2 MDF South Sander Baghouse	9.37	9.37				
Line 2 MDF Reject Baghouse	9.37	9.37				
Line 2 MDF Forming Baghouse	9.37	9.37				
Line 2 MDF Coen Fuel Bin Baghouse	1.88	1.88				
Line 2 MDF Hot Oil Natural Gas Burner	0.50	0.50	11.3	0.47	2.8	0.05
96.4-MMBtu/hr Natural Gas/Diesel Boiler	3.15	2.40	30.40	2.17	34.11	0.83
Total	**650.11**	**498.74**	**1,102.59**	**1,162.48**	**2,763.16**	**22.79**

Riley-Union Stoker Boiler

TSP Emissions

Emission Factor:	0.030 lb/MMBtu {Information from Company, 1/26/94}
Hours of operation	8760 hour/year
Design Capacity:	292.4 MMBtu/hr
	0.030 lb/MMBtu * 292.4 MMBtu/hr = 8.77 lb/hr {Permitted Allowable}
Calculations:	8.77 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 38.4 ton/yr

PM_{10} Emissions:

Emission Factor:	6.94 lb/hr (Permitted Allowable)
Hours of operation	8760 hr/year
Calculations:	6.94 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 30.4 ton/yr

NO_X Emissions:

Emission Factor:	46 lb/MMBtu {Information from Company, 1/26/94}
Hours of operation	8760 hr/year
Design Capacity:	292.4 MMBtu/hr
	0.46 lb/MMBtu * 292.4 MMBtu/hr = 134.50 lb/hr {Permitted Allowable}
Calculations:	134.50 lb/hr * 8760 hr/yr * 0.0005 ton/lb =589.13 ton/yr

VOC Emissions:

Emission Factor:	0.18 lb/ton {AP-42, Table 1.6-3, Rev. 10/92}
Control Efficiency	0.0%
Process Rate:	219000 ton/year {Estimated Maximum}
Calculations:	219000 * ton/yr * 0.18 lb/ton * 0.0005 ton/lb = 19.71 ton/yr

CO Emissions:

Emission Factor:	1.6 lb/MMBtu {Information from manufacturer}
Control Efficiency	0.0%
Design Capacity:	292.4 MMBtu/hr
Calculations:	292.4 MMBtu/hr * 1.6 lb/MMBtu * 8760 hr/yr * .0005 ton/lb = 2049 ton/yr

SO_X Emissions:

Emission Factor:	0.15 lb/ton {AFSEF, SCC 1-02-009-02, page 24}
Control Efficiency	0.0%
Process Rate:	219000 ton/year {Estimated Maximum}
Calculations:	219000 * ton/year * 0.15 lb/ton * 0.0005 ton/lb = 16.43 ton/yr

Veneer Dryer

TSP Emissions

Emission Factor:	0.50 lb/MSF {Information from Company, 1/26/94}
Hours of Operation	8760 hr/yr
Design Capacity:	20 MSF/hr
	0.50 lb/MSF * 20.0 MSF/hr = 10.00 lb/hr {Permitted Allowable}
Calculations:	10.00 lb/hr * 8760 * 0.0005 ton/lb = 43.80 ton/yr

PM_{10} Emissions:

Emission Factor:	0.50 lb/MSF {Information from Company, 1/26/94}
Hours of Operation	8760 hr/yr
Design Capacity:	20 MSF/hr
	0.50 lb/MSF * 20.0 MSF/hr = 0.00 lb/hr Permitted Allowable}
Calculations:	10.00 lb/hr * 8760 * 0.0005 ton/lb = 43.80 ton/yr

VOC Emissions:

Emission Factor:	2.94 lb/10^4 ft^2 {AFSSCC 3-07-007-15, pg 143}
Hours of Operation	8760 hr/yr
Design Capacity:	20 MSF/hr
	2.94 lb/10^4 ft^2 *20.0 MSF/hr = 5.88 lb/hr {Permitted Allowable}
Calculations:	5.88 lb/hr * 8760 * 0.0005 ton/lb = 25.75 ton/yr

Line 1 MDF Sander Baghouse

Hours of Operation: 8500 hr/yr (Permitted Allowable)

TSP Emissions

Emission Factor:	0.005 gr/dscf {Information from Company, 2/9/95}
Design Capacity:	48548 dscfm
	0.005 gr/dscf * 48548 dscfm * 60 min/hr * 1 lb/7000gr =2.08 lb/hr (Permitted Allowable)
Calculations:	8500 hr/yr * 2.08 lb/hr * 0.0005 ton/lb = 8.84 ton/yr

PM_{10} Emissions:

Emission Factor:	0.005 gr/dscf {Information from Company, 2/9/95}
Design Capacity:	48548 dscf 0.005 gr/dscf * 48548 dscfm * 60 min/hr * 1 lb/7000gr = 2.08 lb/hr (Permitted Allowable)
Calculations:	8500 hr/yr * 2.08 lb/hr * 0.0005 ton/lb = 8.84 ton/yr

Line 1 MDF Materials Handling Baghouse

Hours of Operation:	8500 hr/yr (Permitted Allowable)

TSP Emissions

Emission Factor:	0.005 gr/dscf {Information from Company, 2/9/95}
Design Capacity:	44135 dscfm 0.005 gr/dscf * 44135 dscfm * 60 min/hr * 1 lb/7000 gr = 1.89 lb/hr (Permitted Allowable)
Calculations:	8500 hr/yr * 1.89 lb/hr * 0.0005 ton/lb = 8.04 ton/yr

PM_{10} Emissions:

Emission Factor:	0.005 gr/dscf {Information from Company, 2/9/95}
Design Capacity:	44135 dscfm 0.005 gr/dscf * 44135 dscfm * 60 min/hr * 1 lb/7000 gr = 1.89 lb/hr (Permitted Allowable)
Calculations:	8500 hr/yr * 1.89 lb/hr * 0.0005 ton/lb = 8.04 ton/yr

Line 1 MDF Fiber Dryers

Hours of Operation:	8500 hr/yr (Permitted Allowable)
Design Capacity:	100 MMBtu/hr * 1 ton/16MMBtu = 6.25 ton/hr {Face and Core Dryers}

TSP Emissions

Emission Factor:	0.015 gr/dscf {Information from Company, 2/9/95}
Design Capacity:	180000 dscfm {This includes all 4 stacks} 0.015 gr/dscf * 180000 dscfm* 60 min/hr*1 lb/7000 gr = 23.14 lb/hr Permitted Allowable)
Calculations:	8500 hr/yr * 23.14 lb/hr * 0.0005 ton/lb = 98.36 ton/yr

PM_{10} Emissions:

Emission Factor:	0.015 gr/dscf {Information from Company, 2/9/95}
Design Capacity:	180000 dscfm {This includes all 4 stacks} 0.015 gr/dscf* 180000 dscfm* 60 min/hr* 1 lb/7000 gr = 23.14 lb/hr (Permitted Allowable)
Calculations:	8500 hr/yr * 23.14 lb/hr * 0.0005 ton/lb = 98.36 ton/yr

VOC Emissions:

Emission Factor:	2.30 lb/ton
Design Capacity:	57 ton/hr 2.30 lb/ton * 57 ton/hr = 131.10 lb/hr {Permitted Allowable for Face and Core Dryer)
Calculations:	8500 hr/yr * 131.10 lb/hr * 0.0005 ton/lb = 557.18 ton/yr

NO_X Emissions:

Emission Factor:	10.60 lb/ton {Information from Company, 2/9/95}
Design Capacity:	6.25 ton/hr {Information from Company, 2/9/95} 10.60 lb/ton * 6.25 ton/hr = 66.25 lb/hr
Calculations:	8500 hr/yr * 66.25 lb/hr * 0.0005 ton/lb = 281.56 ton/yr

SO_X Emissions:

Emission Factor:	0.075 lb/ton
Design Capacity:	6.25 ton/hr {Information from Company, 2/9/95} 0.075 lb/ton * 6 ton/hr = 0.47 lb/hr
Calculations:	8500 hr/yr * 0.47 lb/hr * 0.0005 ton/lb = 1.99 ton/yr

CO Emissions:

Emission Factor:	13.60 lb/ton
Design Capacity:	6.25 ton/hr {Information from Company, 2/9/95} 13.60 lb/ton * 6 ton/hr = 85.00 lb/hr
Calculations:	8500 hr/yr * 85.00 lb/hr * 0.0005 ton/lb = 361.25 ton/yr

Planer #3 Cyclone

Hours of Operation: 8760 hr/yr

TSP Emissions

Emission Factor:	0.03 gr/dscf {Information from Company, 1/26/94}
Design Capacity:	21600 dscfm 0.03 gr/dscf * 21600 dscfm * 60 min/hr * 1 lb/7000 gr = 5.55 lb/hr {Permitted Allowable}
Calculations:	8760 hr/yr * 5.55 lb/hr * 0.0005 ton/lb = 24.33 ton/yr

PM_{10} Emissions:

Emission Factor:	0.012 gr/dscf {Information from Company, 1/26/94}
Design Capacity:	21600 dscfm 0.012 gr/dscf * 21600 dscfm * 60 min/hr * 1 lb/7000 gr = 2.22 lb/hr {Permitted Allowable}
Calculations:	8760 hr/yr * 2.22 lb/hr * 0.0005 ton/lb = 9.73 ton/yr

Planer #4 Cyclone

Hours of Operation: 8760 hr/yr

TSP Emissions

Emission Factor:	0.03 gr/dscf {Information from Company, 1/26/94}
Design Capacity:	54000 dscfm 0.03 gr/dscf * 54000 dscfm * 60 min/hr* 1 lb/7000gr = 13.89 lb/hr {Permitted Allowable}
Calculations:	8760 hr/yr * 13.89 lb/hr * 0.0005 ton/lb = 60.82 ton/yr

PM_{10} Emissions:

Emission Factor:	0.012 gr/dscf {Information from Company, 1/26/94}
Design Capacity:	54000 dscfm 0.012 gr/dscf * 54000 dscfm * 60 min/hr * 1 lb/7000 gr = 5.55 lb/hr {Permitted Allowable}
Calculations:	8760 hr/yr * 5.55 lb/hr * 0.0005 ton/lb = 24.33 ton/yr

Planer Shavings Bin Cyclone

Hours of Operation: 8760 hr/yr

TSP Emissions

Emission Factor:	0.03 gr/dscf {Information from Company, 1/26/94}
Design Capacity:	5400 dscfm 0.03 gr/dscf * 5400 dscfm * 60 min/hr * 1 lb/7000 gr = 1.39 lb/hr {Permitted Allowable}
Calculations:	8760 hr/yr * 1.39 lb/hr * 0.0005 ton/lb = 6.08 ton/yr

PM_{10} Emissions:

Emission Factor:	0.012 gr/dscf {Information from Company, 1/26/94}
Design Capacity:	5400 dscfm 0.012 gr/dscf * 5400 dscfm * 60 min/hr * 1 lb/7000 gr = 0.56 lb/hr {Permitted Allowable}
Calculations:	8760 hr/yr * 0.56 lb/hr * 0.0005 ton/lb = 2.43 ton/yr

Planer Chip Bin Cyclone

Hours of Operation: 8760 hr/yr

TSP Emissions
Emission Factor: 0.03 gr/dscf {Information from Company, 1/26/94}
Design Capacity: 5400 dscfm
0.03 gr/dscf * 5400 dscfm * 60 min/hr * 1 lb/7000 gr = 1.39 lb/hr {Permitted Allowable}
Calculations: 8760 hr/yr * 1.39 lb/hr * 0.0005 ton/lb = 6.08 ton/yr

PM_{10} Emissions:
Emission Factor: 0.012 gr/dscf {Information from Company, 1/26/94}
Design Capacity: 5400 dscfm
0.012 gr/dscf * 5400 dscfm * 60 min/hr * 1 lb/7000 gr = 0.56 lb/hr {Permitted Allowable}
Calculations: 8760 hr/yr * 0.56 lb/hr * 0.0005 ton/lb = 2.43 ton/yr

Sawmill Chip Bin Cyclone

Hours of Operation: 8760 hr/yr

TSP Emissions
Emission Factor: 0.03 gr/dscf {Information from Company, 1/26/94}
Design Capacity: 5400 dscfm
0.03 gr/dscf * 5400 dscfm * 60 min/hr * 1 lb/7000 gr = 1.39 lb/hr {Permitted Allowable}
Calculations: 8760 hr/yr * 1.39 lb/hr * 0.0005 ton/lb = 6.08 ton/yr

PM_{10} Emissions:
Emission Factor: 0.012 gr/dscf {Information from Company, 1/26/94}
Design Capacity: 5400 dscfm
0.012 gr/dscf * 5400 dscfm * 60 min/hr * 1 lb/7000 gr = 0.56 lb/hr {Permitted Allowable}
Calculations: 8760 hr/yr * 0.56 lb/hr * 0.0005 ton/lb = 2.43 ton/yr

Sawmill Sawdust Target Box

Hours of Operation: 8760 hr/yr

TSP Emissions
Emission Factor: 0.10 lb/BDT Oregon DEQ/AQ Permitting Inspection
Design Capacity: 4.9 BDT/hr {Information from Company, 7/12/95}
0.10 lb/BDT * 4.90 BDT/hr = 0.49 lb/hr
Calculations: 8760 hr/yr * 0.49 lb/hr * 0.0005 ton/lb = 2.15 ton/yr

PM_{10} Emissions:
Emission Factor: 0.05 lb/BDT Oregon DEQ/AQ Permitting Inspection
Design Capacity: 4.9 BDT/hr {Information from Company, 7/12/95}
0.05 lb/BDT * 4.90 BDT/hr = 0.25 lb/hr
Calculations: 8760 hr/yr * 0.25 lb/hr * 0.0005 ton/lb = 1.07 ton/yr

Sawmill Drying Kilns

Hours of Operation: 8760 hr/yr

TSP Emissions
Emission Factor: 0.20 lb/MBF {Information from Company, 7/12/95}
Design Capacity: 186, 457 MBF/yr {NCASI, ltr 3/18/94 from David Word}
0.20 lb/MBF * 186457 MBF/yr 37291.4 lb/MBF
Calculations: 0.20 lb/MBF * 186457 MBF/yr * 0.0005 ton/lb = 18.65 ton/yr

PM_{10} Emissions:

Emission Factor:	0.20 lb/MBF {Information from Company, 7/12/95}
Design Capacity:	186457 MBF/yr {NCASI, ltr 3/18/94 from David Word}
	0.20 lb/MBF * 186457 MBF/yr 37291.4 lb/MBF
Calculations:	0.20 lb/MBF * 186457 MBF/yr * 0.0005 ton/lb = 18.65 ton/yr

VOC Emissions:

Emission Factor:	1.70 lb/MBF {NCASI, TB No. 718, July 1996}
Design Capacity:	186457 MBF/yr {based on average of species tests}
	1.70 lb/MBF * 186457 MBF/yr316976.9 lbs/MBF
Calculations:	1.70 lb/MBF * 186457 MBF/yr * 0.0005 ton/lb = 158.49 ton/yr

Plywood Chip Bin Cyclone

Hours of Operation: 8760 hr/yr

TSP Emissions:

Emission Factor:	0.03 gr/dscf {Information from Company, 1/26/94}{Permitted Allowable}
Design Capacity:	5000 dscfm de minimus Change Notification 2/26/97
	0.03 gr/dscf * 5000 dscfm * 60 min/hr * 1 lb/7000 gr =1.30 lb/hr
Calculations:	8760 hr/yr * 1.30 lb/hr * 0.0005 ton/lb = 5.69 ton/yr

PM_{10} Emissions:

Emission Factor:	0.012 gr/dscf {Information from Company, 1/26/94}
Design Capacity:	5000 dscfm
	0.012 gr/dscf * 5000 dscfm * 60 min/hr * 1 lb/7000 gr = 0.52 lb/hr {Permitted Allowable}
Calculations:	8760 hr/yr * 0.52 lb/hr * 0.0005 ton/lb = 2.28 ton/yr {Permit #2667-07}

Plywood Fines Target Box

Hours of Operation: 8760 hr/yr

TSP Emissions:

Emission Factor:	0.03 gr/dscf (de minimus change notification 2/26/97)
Design Capacity:	2500 dscfm
	0.03 gr/dscf * 2500 dscfm * 60 min/hr * 1 lb/7000 gr = 1.30 lb/hr
Calculations:	8760 hr/yr * 1.30 lb/hr * 0.0005 ton/lb = 5.69 ton/yr

PM_{10} Emissions:

Emission Factor:	0.014 gr/dscf (de minimus change notification 2/26/97)
Design Capacity:	2500 dscfm
	0.014 gr/dscf * 2500 dscfm * 60 min/hr * 1 lb/7000gr =0.852 lb/hr
Calculations:	8760 hr/yr * 0.52 lb/hr * 0.0005 ton/lb = 2.28 ton/yr

Plywood Sander Dust Baghouse

Hours of Operation: 8760 hr/yr

TSP Emissions:

Emission Factor:	0.005 gr/dscf {Information from Company, 2/9/95}
Design Capacity:	31488 dscfm
	0.005 gr/dscf * 31488 dscfm * 60 min/hr * 1 lb/7000 gr = 1.35 lb/hr {Permitted Allowable}
Calculations:	8760 hr/yr * 1.35 lb/hr * 0.0005 ton/lb = 5.91 ton/yr

PM_{10} Emissions:

Emission Factor:	0.005 gr/dscf {Information from Company, 2/9/95}
Design Capacity:	31488 dscfm
	0.005 gr/dscf * 31488 dscfm * 60 min/hr * 1 lb/7000gr = 1.35 lb/hr {Permitted Allowable}
Calculations:	8760 hr/yr * 1.35 lb/hr * 0.0005 ton/lb = 5.91 ton/yr

Plywood 18" Hog Baghouse

Hours of Operation: 8760 hr/yr

TSP Emissions:
- Emission Factor: 0.005 gr/dscf {Information from Company, 2/9/95}
- Design Capacity: 13495 dscfm
  0.005 gr/dscf * 13495 dscfm * 60 min/hr * 1 lb/7000 gr = 0.58 lb/hr {Permitted Allowable}
- Calculations: 8760 hr/yr * 0.58 lb/hr * 0.0005 ton/lb = 2.53 ton/yr

PM_{10} Emissions:
- Emission Factor: 0.005 gr/dscf {Information from Company, 2/9/95}
- Design Capacity: 13495 dscfm
  0.005 gr/dscf * 13495 dscfm * 60 min/hr * 1 lb/7000 gr = 0.58 lb/hr {Permitted Allowable}
- Calculations: 8760 hr/yr * 0.58 lb/hr * 0.0005 ton/lb = 2.53 ton/yr

Plywood 30" Hog Baghouse

Hours of Operation: 8760 hr/yr

TSP Emissions:
- Emission Factor: 0.005 gr/dscf {Information from Company, 2/9/95}
- Design Capacity: 13495 dscfm
  0.005gr/dscf * 13495 dscfm * 60 min/hr * 1 lb/7000 gr = 0.58 lb/hr {Permitted Allowable}
- Calculations: 8760 hr/yr * 0.58 lb/hr * 0.0005 ton/lb = 2.53 ton/yr

PM_{10} Emissions:
- Emission Factor: 0.005 gr/dscf {Information from Company, 2/9/95}
- Design Capacity: 13495 dscfm
  0.005 gr/dscf * 13495 dscfm * 60 min/hr * 1 lb/7000 gr = 0.58 lb/hr {Permitted Allowable}
- Calculations: 8760 hr/yr * 0.58 lb/hr * 0.0005 ton/lb = 2.53 ton/yr

Line 1 MDF N. Sander Baghouse #7

Hours of Operation: 8500 hr/yr {Permitted Allowable}

TSP Emissions:
- Emission Factor: 0.005 gr/dscf {Information from Company, 2/9/95}
- Design Capacity: 49482 dscfm
  0.005 gr/dscf * 49482 dscfm * 60 min/hr * 1 lb/7000 gr = 2.12 lb/hr {Permitted Allowable}
- Calculations: 8500 hr/yr * 2.12 lb/hr * 0.0005 ton/lb = 9.01 ton/yr

PM_{10} Emissions:
- Emission Factor: 0.005 gr/dscf {Information from Company, 2/9/95}
- Design Capacity: 49482 dscfm
  0.005 gr/dscf * 49482 dscfm * 60 min/hr * 1 lb/7000 gr = 2.12 lb/hr {Permitted Allowable}
- Calculations: 8500 hr/yr * 2.12 lb/hr * 0.0005 ton/lb = 9.01 ton/yr

Line 1 MDF S. Sander Baghouse #8

Hours of Operation: 8500 hr/yr {Permitted Allowable}

TSP Emissions:
- Emission Factor: 0.005 gr/dscf {Information from Company, 2/9/95}
- Design Capacity: 49482 dscfm
  0.005 gr/dscf * 49482 dscfm * 60 min/hr * 1 lb/7000 gr = 2.12 lb/hr {Permitted Allowable}
- Calculations: 8500 hr/yr * 2.12 lb/hr * 0.0005 ton/lb = 9.01 ton/yr

PM_{10} Emissions:
- Emission Factor: 0.005 gr/dscf {Information from Company, 2/9/95}
- Design Capacity: 49482 dscfm
  0.005 gr/dscf * 49482 dscfm * 60 min/hr * 1 lb/7000 gr = 2.12 lb/hr {Permitted Allowable}
- Calculations: 8500 hr/yr * 2.12 lb/hr * 0.0005 ton/lb = 9.01 ton/yr

Line 1 MDF Board Trim Baghouse #10

Hours of Operation: 8500 hr/yr {Permitted Allowable}

TSP Emissions:
- Emission Factor: 0.005 gr/dscf {Information from Company, 2/9/95}
- Design Capacity: 4498 dscfm
  0.005 gr/dscf * 4498 dscfm * 60 min/hr * 1 lb/7000 gr = 0.19 lb/hr {Permitted Allowable}
- Calculations: 8500 hr/yr * 0.19 lb/hr * 0.0005 ton/lb = 0.82 ton/yr

PM_{10} Emissions:
- Emission Factor: 0.005 gr/dscf {Information from Company, 2/9/95}
- Design Capacity: 4498 dscfm
  0.005 gr/dscf * 4498 dscfm * 60 min/hr * 1 lb/7000 gr = 0.19 lb/hr {Permitted Allowable}
- Calculations: 8500 hr/yr * 0.19 lb/hr * 0.0005 ton/lb = 0.82 ton/yr

Line 1 MDF Sanderdust Fuel Baghouse

Hours of Operation: 8500 hr/yr {Permitted Allowable}

TSP Emissions:
- Emission Factor: 0.005 gr/dscf {Information from Company, 2/9/95}
- Design Capacity: 13495 dscfm
  0.005 gr/dscf * 13495 dscfm * 60 min/hr * 1 lb/7000 gr = 0.58 lb/hr {Permitted Allowable}
- Calculations: 8500 hr/yr * 0.58 lb/hr * 0.0005 ton/lb = 2.46 ton/yr

PM_{10} Emissions:
- Emission Factor: 0.005 gr/dscf {Information from Company, 2/9/95}
- Design Capacity: 13495 dscfm
  0.005 gr/dscf * 13495 dscfm * 60 min/hr * 1 lb/7000 gr = 0.58 lb/hr {Permitted Allowable}
- Calculations: 8500 hr/yr * 0.58 lb/hr * 0.0005 ton/lb = 2.46 ton/yr

Line 1 MDF Booksaw Baghouse #5

Hours of Operation: 8500 hr/yr {Permitted Allowable}

TSP Emissions:
- Emission Factor: 0.005 gr/dscf {Information from Company, 2/9/95}
- Design Capacity: 44983 dscfm
  0.005 gr/dscf * 44983 dscfm * 60 min/hr * 1 lb/7000 gr = 1.93 lb/hr {Permitted Allowable}
- Calculations: 8500 hr/yr * 1.93 lb/hr * 0.0005 ton/lb = 8.19 ton/yr

PM_{10} Emissions:
- Emission Factor: 0.005 gr/dscf {Information from Company, 2/9/95}
- Design Capacity: 44983 dscfm
  0.005 gr/dscf * 44983 dscfm * 60 min/hr * 1 lb/7000 gr = 1.93 lb/hr {Permitted Allowable}
- Calculations: 8500 hr/yr * 1.93 lb/hr * 0.0005 ton/lb = 8.19 ton/yr

Line 1 MDF Sander Hog Baghouse #6

Hours of Operation: 8500 hr/yr {Permitted Allowable}

TSP Emissions:
- Emission Factor: 0.005 gr/dscf {Information from Company, 2/9/95}
- Design Capacity: 44983 dscfm
  0.005 gr/dscf * 44983 dscfm * 60 min/hr * 1 lb/7000 gr = 1.93 lb/hr {Permitted Allowable}
- Calculations: 8500 hr/yr * 1.93 lb/hr * 0.0005 ton/lb = 8.19 ton/yr

PM_{10} Emissions:
- Emission Factor: 0.005 gr/dscf {Information from Company, 2/9/95}
- Design Capacity: 44983 dscfm
  0.005 gr/dscf * 44983 dscfm * 60 min/hr * 1 lb/7000 gr = 1.93 lb/hr {Permitted Allowable}
- Calculations: 8500 hr/yr * 1.93 lb/hr * 0.0005 ton/lb = 8.19 ton/yr

Line 1 MDF Metering Bin Baghouse #1

Hours of Operation: 8500 hr/yr {Permitted Allowable}

TSP Emissions:
- Emission Factor: 0.005 gr/dscf {Information from Company, 2/9/95}
- Design Capacity: 44983 dscfm
  0.005 gr/dscf * 44983 dscfm * 60 min/hr * 1 lb/7000 gr = 1.93 lb/hr {Permitted Allowable}
- Calculations: 8500 hr/yr * 1.93 lb/hr * 0.0005 ton/lb = 8.19 ton/yr

PM_{10} Emissions:
- Emission Factor: 0.005 gr/dscf {Information from Company, 2/9/95}
- Design Capacity: 44983 dscfm
  0.005 gr/dscf * 44983 dscfm * 60 min/hr * 1 lb/7000gr = 1.93 lb/hr {Permitted Allowable}
- Calculations: 8500 hr/yr * 1.93 lb/hr * 0.0005 ton/lb = 8.19 ton/yr

Line 1 MDF Felter Baghouse #1

Hours of Operation: 8500 hr/yr {Permitted Allowable}

TSP Emissions:
- Emission Factor: 0.005 gr/dscf {Information from Company, 2/9/95}
- Design Capacity: 44983 dscfm
  0.005 gr/dscf * 44983 dscfm * 60 min/hr * 1 lb/7000 gr = 1.93 lb/hr {Permitted Allowable}
- Calculations: 8500 hr/yr * 1.93 lb/hr * 0.0005 ton/lb = 8.19 ton/yr

PM_{10} Emissions:
- Emission Factor: 0.005 gr/dscf {Information from Company, 2/9/95}
- Design Capacity: 44983 dscfm
  0.005 gr/dscf * 44983 dscfm * 60 min/hr * 1 lb/7000 gr = 1.93 lb/hr {Permitted Allowable}
- Calculations: 8500 hr/yr * 1.93 lb/hr * 0.0005 ton/lb = 8.19 ton/yr

Line 1 MDF Felter Baghouse #2

Hours of Operation: 8500 hr/yr {Permitted Allowable}

TSP Emissions:
- Emission Factor: 0.005 gr/dscf {Information from Company, 2/9/95}
- Design Capacity: 44983 dscfm
  0.005 gr/dscf * 44983 dscfm * 60 min/hr * 1 lb/7000 gr = 1.93 lb/hr {Permitted Allowable}
- Calculations: 8500 hr/yr * 1.93 lb/hr * 0.0005 ton/lb = 8.19 ton/yr

PM_{10} Emissions:
- Emission Factor: 0.005 gr/dscf {Information from Company, 2/9/95}
- Design Capacity: 44983 dscfm
  0.005 gr/dscf * 44983 dscfm * 60 min/hr * 1 lb/7000 gr = 1.93 lb/hr {Permitted Allowable}
- Calculations: 8500 hr/yr * 1.93 lb/hr * 0.0005 ton/lb = 8.19 ton/yr

Line 1 MDF Blr Sndrdst Boiler Baghouse #11

Hours of Operation: 8500 hr/yr {Permitted Allowable}

TSP Emissions:
- Emission Factor: 0.005 gr/dscf {Information from Company, 2/9/95}
- Design Capacity: 13495 dscfm
  0.005 gr/dscf * 13495 dscfm * 60 min/hr * 1 lb/7000 gr = 0.58 lb/hr {Permitted Allowable}
- Calculations: 8500 hr/yr * 0.58 lb/hr * 0.0005 ton/lb = 2.46 ton/yr

PM_{10} Emissions:
- Emission Factor: 0.005 gr/dscf {Information from Company, 2/9/95}
- Design Capacity: 13495 dscfm
  0.005 gr/dscf * 13495 dscfm * 60 min/hr * 1 lb/7000 gr = 0.58 lb/hr {Permitted Allowable}
- Calculations: 8500 hr/yr * 0.58 lb/hr * 0.0005 ton/lb = 2.46 ton/yr

Line 1 MDF Forming and Finishing

Press Vents (6 fans)
Board Cooler Fans (10 fans)
Press Unload Fans (3 fans)
Hours of Operation: 8500 hr/yr {Permitted Allowable}

TSP Emissions:
Emission Factor: 25.80 lb/hr {Information from Company, 2/9/95} {Permitted Allowable}
Calculations: 8500 hr/yr * 25.80 lb/hr * 0.0005 ton/lb = 109.65 ton/yr

PM_{10} Emissions:
Emission Factor: 9.50 lb/hr {Information from Company, 2/9/95}{Permitted Allowable}
Calculations: 8500 hr/yr * 9.50 lb/hr * 0.0005 ton/lb = 40.38 ton/yr

VOC Emissions:
Emission Factor: 13.40 lb/hr {Information from Company, 2/9/95} {Permitted Allowable}
Calculations: 8500 hr/yr * 13.40 lb/hr * 0.0005 ton/lb = 56.95 ton/yr

Line 2 MDF Fiber Dryers

Hours of Operation: 8760 hr/yr (Permitted Allowable)
Design Capacity: 85 MMBtu/hr * 1 ton/16MMBtu = 5.31 ton/hr
5.31 ton/hr * 8760 hr/yr = 46500 ton/yr

TSP Emissions
Emission Factor: 0.015 gr/dscf {Information from Company, 2/9/95}
Design Capacity: 140000 dscfm {This includes all 4 stacks}
0.015 gr/dscf * 140000 dscfm * 60 min/hr * 1 lb/7000 gr = 18.0 lb/hr (Permitted Allowable)
Calculations: 8760 hr/yr * 18.0 lb/hr * 0.0005 ton/lb = 78.8 ton/yr

PM_{10} Emissions:
Emission Factor: 0.015 gr/dscf {Information from Company, 2/9/95}
Design Capacity: 140000 dscfm {This includes all 4 stacks}
0.015 gr/dscf * 140000 dscfm * 60 min/hr * 1 lb/7000gr = 18.0 lb/hr (Permitted Allowable)
Calculations: 8760 hr/yr * 18.0 lb/hr * 0.0005 ton/lb = 78.8 ton/yr

VOC Emissions:
Emission Factor: 2.30 lb/ton
Design Capacity: 33.1 ton/hr
2.30 lb/ton * 33.1 ton/hr = 76.1 lb/hr {Permitted Allowable for Core Dryer)
Calculations: 8760 hr/yr * 76.1 lb/hr * 0.0005 ton/lb = 333.0 ton/yr

NO_X Emissions:
Control Efficiency: 23% FGR/LNB (Efficiency provided by Plum Creek on 08/03/99)
Emission Factor: 10.60 lb/ton {Information from Company, 2/9/95}
Design Capacity: 5.31 ton/hr {Information from Company, 2/9/95}
0.60 lb/ton * 5.31 ton/hr = 56.3 lb/hr
Calculations: 8760 hr/yr * 56.3 lb/hr * 0.0005 ton/lb = 247.0 ton/yr
47.0 ton/yr * (1.0 – 0.23) = 190.2 ton/yr

SO_X Emissions:
Emission Factor: 0.15 lb/ton
Design Capacity: 46500 ton/yr {Information from Company, 2/9/95}
0.15 lb/ton * 46500 ton/yr = 6975.0 lb/yr
Calculations: 6975.0 lb/yr * 0.0005 ton/lb = 3.49 ton/yr

CO Emissions:

Emission Factor:	13.60 lb/ton
Design Capacity:	46500 ton/yr {Information from Company, 2/9/95}
	13.60 lb/ton * 46500 ton/yr = 632400 lb/yr
Calculations:	632400 lb/yr * 0.0005 ton/lb = 316.2 ton/yr

Line 2 Press Emissions

Hours of Operation:	8760 hr/yr
Additional flow to ESP =	25000 dscfm

PM Emissions

Emission Factor:	0.015 gr/dscf {Permit Limit}
	0.015 gr/dscf * 25000 dscfm * 60 min/hr * 1 lb/7000gr = 3.21 lb/hr
Calculations:	8760 hr/yr * 3.21 lb/hr * 0.0005 ton/lb = 14.1 ton/yr

PM_{10} Emissions:

Emission Factor:	0.015 gr/dscf {Permit Limit}
	0.015 gr/dscf * 25000 dscfm * 60 min/hr * 1 lb/7000gr = 3.21 lb/hr
Calculations:	8760 hr/yr * 3.21 lb/hr * 0.0005 ton/lb = 14.1 ton/yr

VOC Emissions:

Emission Factor:	2.0 lb/hr {based on industry data}
	2.0 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 8.76 ton/yr

Line 2 North Sander Baghouse

Hours of Operation:	8760 hr/yr (Permitted Allowable)
Design Capacity:	50000 cfm

PM Emissions

Emission Factor:	0.005 gr/dscf {Basis for limit}
Design Capacity:	50000 dscfm
	0.005 gr/dscf * 50000 dscfm * 60 min/hr * 1 lb/7000 gr = 2.14 lb/hr (Permitted Allowable)
Calculations:	8760 hr/yr * 2.14 lb/hr * 0.0005 ton/lb = 9.37 ton/yr

PM_{10} Emissions:

Emission Factor:	0.005 gr/dscf {Basis for limit}
Design Capacity:	50000 dscfm
	0.005 gr/dscf * 50000 dscfm * 60 min/hr * 1 lb/7000 gr = 2.14 lb/hr (Permitted Allowable)
Calculations:	8760 hr/yr * 2.14 lb/hr * 0.0005 ton/lb = 9.37 ton/yr

Line 2 South Sander Baghouse

Hours of Operation:	8760 hr/yr (Permitted Allowable)
Design Capacity:	50000 cfm

PM Emissions

Emission Factor:	0.005 gr/dscf {Basis for limit}
Design Capacity:	50000 dscfm
	0.005 gr/dscf * 50000 dscfm * 60 min/hr * 1 lb/7000 gr = 2.14 lb/hr (Permitted Allowable)
Calculations:	8760 hr/yr * 2.14 lb/hr * 0.0005 ton/lb = 9.37 ton/yr

PM_{10} Emissions:

Emission Factor:	0.005 gr/dscf {Basis for limit}
Design Capacity:	50000 dscfm
	0.005 gr/dscf * 50000 dscfm * 60 min/hr * 1 lb/7000 gr = 2.14 lb/hr (Permitted Allowable)
Calculations:	8760 hr/yr * 2.14lb/hr * 0.0005 ton/lb = 9.37 ton/yr

Line 2 Reject Baghouse

Hours of Operation: 8760 hr/yr (Permitted Allowable)
Design Capacity: 50000 cfm

PM Emissions
Emission Factor: 0.005 gr/dscf {Basis for limit}
Design Capacity: 50000 dscfm
0.005 gr/dscf * 50000 dscfm * 60 min/hr * 1 lb/7000 gr = 2.14 lb/hr (Permitted Allowable)
Calculations: 8760 hr/yr * 2.14 lb/hr * 0.0005 ton/lb = 9.37 ton/yr

PM_{10} Emissions:
Emission Factor: 0.005 gr/dscf {Basis for limit}
Design Capacity: 50000 dscfm
0.005 gr/dscf * 50000 dscfm * 60 min/hr * 1 lb/7000 gr = 2.14 lb/hr (Permitted Allowable)
Calculations: 8760 hr/yr * 2.14 lb/hr * 0.0005 ton/lb = 9.37 ton/yr

Line 2 Forming Baghouse

Hours of Operation: 8760 hr/yr (Permitted Allowable)
Design Capacity: 50000 cfm

PM Emissions
Emission Factor: 0.005 gr/dscf {Basis for limit}
Design Capacity: 50000 dscfm
0.005 gr/dscf * 50000 dscfm * 60 min/hr * 1 lb/7000 gr = 2.14 lb/hr (Permitted Allowable)
Calculations: 8760 hr/yr * 2.14 lb/hr * 0.0005 ton/lb = 9.37 ton/yr

PM_{10} Emissions:
Emission Factor: 0.005 gr/dscf {Basis for limit}
Design Capacity: 50000 dscfm
0.005 gr/dscf * 50000 dscfm * 60 min/hr * 1 lb/7000 gr = 2.14 lb/hr (Permitted Allowable)
Calculations: 8760 hr/yr * 2.14 lb/hr * 0.0005 ton/lb = 9.37 ton/yr

Line 2 Coen Fuel Bin Baghouse

Hours of Operation: 8760 hr/yr (Permitted Allowable)
Design Capacity: 10000 cfm

PM Emissions
Emission Factor: 0.005 gr/dscf {Basis for limit}
Design Capacity: 10000 dscfm
0.005 gr/dscf * 10000 dscfm * 60 min/hr * 1 lb/7000gr = 0.43 lb/hr (Permitted Allowable)
Calculations: 8760 hr/yr * 0.43 lb/hr * 0.0005 ton/lb = 1.88 ton/yr

PM_{10} Emissions:
Emission Factor: 0.005 gr/dscf {Basis for limit}
Design Capacity: 10000 dscfm
0.005 gr/dscf * 10000 dscfm * 60 min/hr * 1 lb/7000 gr = 0.43 lb/hr (Permitted Allowable)
Calculations: 8760 hr/yr * 0.43 lb/hr * 0.0005 ton/lb = 1.88 ton/yr

Line 2 MDF Hot Oil Natural Gas Burner

Hours of Operation: 8760 hr/yr
The 17.7 MMBtu/hr natural gas burner will burn 18436 scf/hr of natural gas or 161.5 mmcf/yr.

PM Emissions
Emission Factor: 6.2 lb/mmcf {AP-42, Table 1.4-1, Rev. 10/92}
Design Capacity: 6.2 lb/mmcf * 18436 scf/yr * 1 mmcf/1000000 scf = 0.11 lb/hr
0.11 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.50 ton/yr

PM_{10} Emissions:
Emission Factor: 6.2 lb/mmcf {AP-42, Table 1.4-1, Rev. 10/92}
Design Capacity: 6.2 lb/mmcf * 18436 scf/yr * 1 mmcf/1000000 scf = 0.11 lb/hr
0.11 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.50 ton/yr

VOC Emissions:
Emission Factor: 5.8 lb/mmcf {AP-42, Table 1.4-1, Rev. 10/92}
Design Capacity: 5.8 lb/mmcf * 18436 scf/yr * 1 mmcf/1000000 scf = 0.107 lb/hr
0.107 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.47 ton/yr

NO_X Emissions:
Emission Factor: 100 lb/mmcf {AP-42, Table 1.4-1, Rev. 10/92}
Design Capacity: 100 lb/mmcf * 18436 scf/yr * 1 mmcf/1000000 scf = 1.84 lb/hr
1.84 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 8.08 ton/yr

CO Emissions:
Emission Factor: 35 lb/mmcf {AP-42, Table 1.4-1, Rev. 10/92}
Design Capacity: 35 lb/mmcf * 18436 scf/yr * 1 mmcf/1000000 scf = 0.645 lb/hr
0.645 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 2.83 ton/yr

96.4-MMBtu/hr Natural Gas/Diesel Boiler (75,000 lb/hr)

Hours of Operation: 8520 hr/yr fired on natural gas
Gallons per Year Diesel Consumption: 165000 gal/yr

TSP Emissions Natural Gas
Emission Factor 7.6 lb/MMscf (AP-42, Table 1.4-2 7/98)
Hourly Calculation (7.6 lb/MMscf) / (1020 Btu/scf) * (96.4 lb/MMBtu) * (8520/8760 hr/hr) = 0.70 lb/hr
Annual Calculation 0.70 lb/hr * ((8520 hr/yr * 0.0005 ton/lb)) = 2.98 ton/yr

TSP Emissions Diesel
Emission Factor 2 lb/mgal (AP-42, Table 1.3-1 9/98)
Annual Calculation 2 lb/mgal * ((165000gal/yr)/1000) * (1 ton/2000 lb) = 0.17 ton/yr

PM_{10} Emissions:
Emission Factor 5.7 lb/MMscf (AP-42, Table 1.4-2 7/98)
Hourly Calculation (5.7 lb/MMscf) / (1020 Btu/scf) * (96.4 lb/MMBtu) * (8520/8760 hr/hr) = 0.52 lb/hr
Annual Calculation 0.52 lb/hr * ((8520 hr/yr * 0.0005 ton/lb)) = 2.23 ton/yr

PM_{10} Emissions Diesel
Emission Factor 2 lb/mgal (AP-42, Table 1.3-1 9/98)
Annual Calculation 2 lb/mgal * ((165000gal/yr)/1000) * (1 ton/2000 lb) = 0.17 ton/yr

NO_X Emissions Natural Gas:
Emission Factor: 0.07 lb/MMBtu (BACT)
Fuel Consumption: 96.4 MMBtu/hr
Hourly Calculation: 0.07 lb/MMBtu * (96.4 MMBtu/hr) = 6.75 lb/hr
Annual Calculation 6.75 lb/hr * ((8520 hr/yr * 0.0005 ton/lb)) = 28.75 ton/yr

NO_X Emissions Diesel
Emission Factor 20 lb/mgal (AP-42, Table 1.3-1 9/98)

Annual Calculation 20 lb/mgal * ((165000gal/yr)/1000) * (1 ton/2000 lb) = 1.65 ton/yr

CO Emissions Natural Gas:

Emission Factor: 0.082 lb/MMBtu (BACT)
Fuel Consumption: 96.4 MMBtu/hr
Hourly Calculation: 0.082 lb/MMBtu * (96.4 MMBtu/hr) = 7.91 lb/hr
Annual Calculation 7.91 lb/hr * ((8520 hr/yr * 0.0005 ton/lb)) = 33.70 ton/yr

CO Emissions Diesel

Emission Factor 5 lb/mgal (AP-42, Table 1.3-1 9/98)
Annual Calculation 5 lb/mgal * ((165000gal/yr)/1000) * (1 ton/2000 lb) = 0.41ton/yr

VOC Emissions Natural Gas:

Emission Factor 5.5 lb/MMscf (AP-42, Table 1.4-2 7/98)
Hourly Calculation (5.5 lb/MMscf) / (1020 Btu/scf) * (96.4 lb/MMBtu) * (8520/8760 hr/hr) = 0.51 lb/hr
Annual Calculation 0.51 lb/hr * ((8520 hr/yr * 0.0005 ton/lb)) = 2.15 ton/yr

VOC Emissions Diesel:

Emission Factor 0.2 lb/mgal (AP-42, Table 1.3-1 9/98)
Annual Calculation 0.2 lb/mgal * ((165000gal/yr)/1000) * (1 ton/2000 lb) = 0.02 ton/yr

SO_X Emissions Natural Gas:

Emission Factor: 0.60 lb/MMcf (AP-42, 1.4-2 7/98)
Hourly Calculation (0.6 lb/MMscf) / (1020 Btu/scf) * (96.4 lb/MMBtu) * (8520/8760 hr/hr) = 0.06 lb/hr
Annual Calculation 0.06 lb/hr * ((8520 hr/yr * 0.0005 ton/lb)) = 0.24 ton/yr

SO_X Emissions Diesel:

Emission Factor 7.1 lb/mgal (AP-42, Table 1.3-1 9/98)
Annual Calculation 7.1 lb/mgal * ((165000gal/yr)/1000) * (1 ton/2000 lb) = 0.59 ton/yr

B. Estimate of Maximum Fugitive Emissions from the facility

	TSP (TPY)	PM_{10} (TPY)
Planer Process		
Shaving Bin Loadout	15.8	9.0
Chip Bin Loadout	0.5	0.24
Sawmill Process		
Debarker	4.4	2.0
Block Saw	6.7	4.0
Hog (wet)	0.5	0.2
Chip Bin	3.8	2.3
Sawdust Bin	11.0	6.4
Plywood Veneer Prep.		
Debarker	6.3	2.8
Block saw	2.4	1.4
Hog (wet)	0.5	0.2
Chip Bin Loadout	4.2	2.6
Wet Fuel Pile	3.3	2.0
MDF Materials Handling	7.24	3.45
Hog Boiler Fuel Handling	1.35	0.63
Mobile Sources		
Log Trucks	17.2	6.2
Chip, Shaving, Sawdust Trucks	19.2	6.9
Lumber Trucks	5.6	2.0
Le Tourneaus	2.8	1.0
Front End Loaders (MDF)	2.2	0.8
Front End Loaders (Log Yard)	7.5	2.7
Dump Trucks	8.1	2.9
Employee Vehicles	7.2	2.6
Total Fugitive Estimate	137.8	62.3

V. Existing Air Quality and Monitoring Requirements

The Columbia Falls area is designated as a nonattainment area for PM_{10}. However, for the other criteria pollutants, the Columbia Falls Area is attainment/unclassified. The Columbia Falls area (including the Plum Creek facility) was designated as a nonattainment area for PM_{10} by EPA on November 15, 1990.

Lorenzen Engineering submitted air dispersion modeling on behalf of Plum Creek. The airborne concentrations of CO, SO_2, NO_X, and PM_{10} were modeled to demonstrate compliance with the Montana and National Ambient Air Quality Standards (MAAQS and NAAQS) and the NO_X PSD increments. The ISC3-PRIME model was used along with five years of National Weather Service (NWS) data from Kalispell (1987-1991) and the corresponding years of upper air data from Spokane, Washington.

The receptor grid was generated, using the linear interpolation method, from digital elevation model (DEM) files of 7.5-minute United States Geological Survey (USGS) topographical maps. The receptor spacing was 25 meters along the fence line and 200meters out to a distance of 2,000 meters. Hotspot receptors were included at 10 meter spacing around peak modeled impacts. Additional Class I receptors were included at the boundaries of Glacier Park, the Bob Marshall Wilderness and the Flathead Indian Reservation.

Building dimension information was used with the EPA Building Profile Input Program (BPIP) to calculate downwash parameters for input to ISC-PRIME.

Plum Creek is planning to routinely operate the boiler on natural gas but has requested the ability to use diesel fuel for up to 10 days per year. The annual emission rates requested are based on 365 days per year of natural gas usage and 10 days of diesel usage. Emissions are higher with the diesel fuel mix and the hourly emission limit requested for that was used in the short-term modeling.

The modeled impacts from this facility were all significantly less than established significance levels and a full impact analysis was not conducted for any of the pollutants. In the PM-10 non-attainment area the maximum reported impacts were 0.044 micrograms per cubic meter (ug/m^3) (4.4% of significance) for the annual analysis and 1.54 ug/m^3 (30.8% of significance) for the 24-hour analysis. Impacts from this facility will not cause or contribute to a violation of any National or Montana Ambient Air Quality Standard.

Since the minor source baseline date for NO_X has been triggered, Plum Creek submitted an analysis of the cumulative Class I and Class II PSD increment consumption due to this permitting action. The maximum modeled Class I increment impact was at Glacier Park (0.015 ug/m^3), adding this impact to the previous impacts resulted in a total impact of 0.24 ug/m^3, which is less than 10% of the Class I increment. The maximum modeled Class II impact was 0.390 ug/m^3, adding this to the previous impact gives a total of 3.95 ug/m^3, which is about 16% of the Class II increment. This facility will not cause or contribute to a violation of any PSD increment.

VI. Ambient Air Impact Analysis

The Department determined, based on various analyses provided by Plum Creek (as described in the previous section), that the impact from this permitting action will not cause or contribute to a violation of an ambient air quality standard, and no ambient standard or increment was violated at the time the projects were implemented.

VII. Taking or Damaging Implication Analysis

As required by 2-10-101 through 105, MCA, the Department conducted a private property taking and damaging assessment and determined there are no taking or damaging implications.

VIII. Environmental Assessment

An environmental assessment, required by the Montana Environmental Policy Act, was completed for this project. A copy is attached.

DEPARTMENT OF ENVIRONMENTAL QUALITY
Permitting and Compliance Division
Air Resources Management Bureau
1520 East Sixth Avenue
P.O. Box 200901, Helena, Montana 59620-0901
(406) 444-3490

FINAL ENVIRONMENTAL ASSESSMENT (EA)

Issued For: Plum Creek Manufacturing, L.P.
Columbia Falls Facility
P.O. Box 1990
Columbia Falls, Montana 59912-1990

Air Quality Permit Number*:* 2667-12

Preliminary Determination on Permit Issued: November 15, 2004
Department Decision on Permit Issued: December 1, 2004
Final Decision Issued: December 16, 2004

1. *Legal Description of Site:* The Plum Creek – Columbia Falls facility is located in Section 7 and the SW¼ of Section 8, Township 30 North, Range 20 West, in Flathead County, Montana.

2. *Description of Project:* Plum Creek submitted a complete Montana Air Quality Permit application to the Department for the addition of a 1993 Babcock and Wilcox 96.4-MMBtu/hr (75,000 lb/hr) boiler to be fired on natural gas and diesel fuel. Plum Creek also plans to remove the 22,000 lb/hr CE Boiler and the 20,000 lb/hr Plywood Boiler.

3. *Objectives of Project:* The proposed project would provide business and revenue for Plum Creek by allowing the company to produce steam for the plant.

4. *Alternatives Considered:* In addition to the proposed action, the Department also considered the "no-action" alternative. The "no-action" alternative would deny issuance of the Montana Air Quality Permit to the proposed facility. However, the Department does not consider the "no-action" alternative to be appropriate because Plum Creek demonstrated compliance with all applicable rules and regulations as required for permit issuance. Therefore, the "no-action" alternative was eliminated from further consideration.

5. *A Listing of Mitigation, Stipulations and Other Controls:* A listing of the enforceable permit conditions and a permit analysis, including a BACT analysis, would be contained in Permit #2667-12.

6. *Regulatory Effects of Private Property:* The Department considered alternatives to the conditions imposed in this permit as part of the permit development. The Department determined the permit conditions are reasonably necessary to ensure compliance with applicable requirements and demonstrate compliance with those requirements and do not unduly restrict private property rights.

7. The following table summarizes the potential physical and biological effects of the proposed project on the human environment. The "no-action alternative" was discussed previously.

		Major	Moderate	Minor	None	Unknown	Comments Included
A	Terrestrial and Aquatic Life and Habitats			X			Yes
B	Water Quality, Quantity and Distribution			X			Yes
C	Geology and Soil Quality, Stability and Moisture			X			Yes
D	Vegetation Cover, Quantity and Quality			X			Yes
E	Aesthetics			X			Yes
F	Air Quality			X			Yes
G	Unique Endangered, Fragile or Limited Environmental Resources			X			Yes
H	Demands on Environmental Resources of Water, Air and Energy			X			Yes
I	Historical and Archaeological Sites				X		Yes
J	Cumulative and Secondary Impacts			X			Yes

SUMMARY OF COMMENTS ON POTENTIAL PHYSICAL AND BIOLOGICAL EFFECTS: The following comments have been prepared by the Department.

A. Terrestrial and Aquatic Life and Habitats

Minor impacts to terrestrial and aquatic life and habitats would be expected from the proposed project because deer, coyotes, geese, ducks, and other terrestrials would potentially use the area around the boiler and because the boiler would be a source of air pollutants. The boiler would emit air pollutants and, through modeling, the Department determined corresponding deposition of pollutants would occur; however, the Department determined that any impacts from deposition would be minor. Any impacts from boiler construction would be minor due to the relatively small size of the project and the relatively short period of time required for construction. Overall, any impacts to terrestrial and aquatic life and habitats would be minor.

B. Water Quality, Quantity and Distribution

Minor impacts would be expected on water quality, quantity, and distribution from the proposed project because the boiler would be a source of pollutants. The boiler would have no direct discharges into surface water. In addition, the boiler would emit air pollutants and corresponding deposition of pollutants would occur. However, the Department determined because of the relative size of the boiler that any impact resulting from the deposition of pollutants on water quality, quantity, and distribution would be minor.

In addition, water quality, quantity, and distribution would not be impacted from constructing the boiler because there is no surface water at or relatively close to the site. Furthermore, no direct discharges into surface water would occur and no use of surface water would be expected for boiler construction. Therefore, no impacts to water quality, quantity, and distribution would be expected from boiler construction. Overall, any impacts to water quality, quantity, and distribution would be minor.

C. Geology and Soil Quality, Stability and Moisture

Minor impacts would occur on the geology and soil quality, stability, and moisture from the proposed project because minor construction would be required to build the boiler. In addition, no discharges, other than air emissions, would occur from the boiler. Any impacts to the geology and soil quality, stability and moisture from boiler construction would be minor due to the relatively small size of the project.

Further, deposition of pollutants would occur; however, the Department determined, through modeling, that any impacts resulting from the deposition of pollutants on the soils surrounding the site would be minor. Overall, any impacts to the geology and soil quality, stability, and moisture would be minor because of deposition of pollutants.

D. Vegetation Cover, Quantity and Quality

Minor impacts would occur on vegetation cover, quantity, and quality because minor construction would be required to develop the boiler. In addition, no discharges, other than air emissions, would occur at the boiler. Any impacts to the vegetation cover, quantity, and quality from boiler construction would be minor due to the relatively small size of the project.

The boiler would be a source of air pollutants and corresponding deposition of pollutants would occur. However, the Department determined that any impacts resulting from the deposition of pollutants on the existing vegetation cover, quantity, and quality would be minor. Overall, any impacts to vegetation cover, quantity, and quality would be minor because of deposition of pollutants.

E. Aesthetics

The boiler would create additional noise in the area. However, any auditory aesthetic impacts would be minor because the boiler would operate enclosed indoors. Overall, any aesthetic impacts would be minor.

F. Air Quality

The air quality of the area would realize minor impacts from the proposed project because the boiler would emit the following air pollutants: PM_{10}; NO_X; CO; VOC; and SO_X. Air emissions from the boiler would be minimized by limitations and conditions that would be included in Permit #2667-12. Conditions would include, but would not be limited to, BACT emission limits and opacity limitations on the proposed boiler. In addition, based on previous analysis of sources of this type operating under similar conditions, the Department believes that the emissions resulting from the proposed boiler would exhibit good dispersion characteristics resulting in relatively low deposition impacts. While deposition of pollutants would occur as a result of operating the boiler, the Department determined that the impacts from deposition of pollutants would be minor due to dispersion characteristics of pollutants (stack height, stack temperature, etc.), the atmosphere (wind speed, wind direction, ambient temperature, etc.), and conditions that would be placed in Permit #2667-12. The amount of air concentration of pollutants would be relatively small, and the corresponding deposition of those air pollutants would be minor.

Since emissions from the proposed boiler would exhibit good dispersion characteristics and

would not exceed the Montana ambient air quality modeling threshold, the Department determined that controlled emissions from the source will not cause or contribute to a violation of any ambient air quality standard. Therefore, any impacts to air quality from the proposed boiler would be minor.

G. Unique Endangered, Fragile or Limited Environmental Resources

This permitting action may result in minor impacts to terrestrial and aquatic life and/or their habitat; therefore, it is possible that unique, rare, threatened, or endangered species may experience minor impacts. However, the Department is not aware of any unique, rare, threatened, or endangered species in the area surrounding the facility. Further, as described in Section 7.F. of this EA, pollutant emissions generated from the facility would have minimal impacts on air quality in the immediate and surrounding area because of the relatively small amount of pollution emitted. There would not be any additional impact to these resources because the project would occur at an already disturbed site.

H. Demands on Environmental Resource of Water, Air and Energy

The proposed project would have minor impacts on the demands for the environmental resources of air, because the facility would be a minor source of air pollutants. Deposition of pollutants would occur as a result of operating the boiler; however, the Department determined that any impacts from deposition of pollutants would be minor.

The proposed project would be expected to have minor impacts on the demand for the environmental resource of energy because fuel would be required for the boiler. The impact on the demand for the non-renewable environmental resource of energy would be minor because the facility would be relatively small by industrial standards. Overall, the impacts for the demands on the environmental resources of water, air, and energy would be minor.

I. Historical and Archaeological Sites

This project would not disturb a greater land surface than has already been occupied by the facility. This project would occur within the boundaries of the area already disturbed. Therefore, no impacts to any historical and archaeological sites would be anticipated.

J. Cumulative and Secondary Impacts

Increases in actual pollutant emissions above historical levels may result in minor cumulative and secondary impacts to terrestrial and aquatic habitats, water quality, and air quality. Minor cumulative or secondary impacts are expected to result from this project.

8. The following table summarizes the potential economic and social effects of the proposed project on the human environment. The "no action alternative" was discussed previously.

		Major	Moderate	Minor	None	Unknown	Comments Included
A	Social Structures and Mores				X		Yes
B	Cultural Uniqueness and Diversity				X		Yes
C	Local and State Tax Base and Tax Revenue			X			Yes
D	Agricultural or Industrial Production				X		Yes
E	Human Health			X			Yes
F	Access to and Quality of Recreational and Wilderness Activities				X		Yes
G	Quantity and Distribution of Employment			X			Yes
H	Distribution of Population				X		Yes
I	Demands for Government Services			X			Yes
J	Industrial and Commercial Activity				X		Yes
K	Locally Adopted Environmental Plans and Goals			X			Yes
L	Cumulative and Secondary Impacts			X			Yes

SUMMARY OF COMMENTS ON POTENTIAL ECONOMIC AND SOCIAL EFFECTS: The following comments have been prepared by the Department.

A. Social Structures and Mores

This permitting action would not have any impact on social structures and mores because it occurs within a facility that already exists.

B. Cultural Uniqueness and Diversity

There would be no change to the cultural uniqueness and diversity of the area as a result of this permitting action because it occurs within a facility that already exists.

C. Local and State Tax Base and Tax Revenue

The proposed project would result in minor impacts to the local and state tax base and tax revenue because relatively few new employees would be expected as a result of constructing the boiler. Further, the proposed project would necessitate negligible construction activities and typically would not require an extended period of time for completion. Therefore, any construction related jobs would be temporary and any corresponding impacts on the tax base/revenue in the area would be minor. Overall, any impacts to the local and state tax base would be minor.

D. Agricultural or Industrial Production

This permitting action would not impact local agricultural or industrial production because it occurs within a facility that already exists.

E. Human Health

The proposed project would result in minor, if any, impacts to human health. Deposition of pollutants would occur; however, the Department determined that the proposed project would comply with all applicable air quality rules, regulations, and standards. These rules, regulations, and standards are designed to be protective of human health. Overall any impacts to public health would be minor.

F. Access to and Quality of Recreational and Wilderness Activities

This project would not have an impact on recreational or wilderness activities because the construction site is far removed from recreational and wilderness areas or access routes. This project would not result in any changes in access to and quality of recreational and wilderness activities.

G. Quantity and Distribution of Employment

This project would not result in any impacts to the quantity and distribution of employment at the facility or surrounding community because no new employees would be hired as a result of this project. However, temporary construction-related positions could result from this project but any impacts to the quantity and distribution of employment would be minor.

H. Distribution of Population

This project does not involve any significant physical or operational change that would affect the location, distribution, density, or growth rate of the human population. The distribution of population would not change as a result of this project.

I. Demands of Government Services

Minor demands for government services would be expected. Additional time would potentially be spent on verifying the facility's compliance and issuing the necessary permits.

J. Industrial and Commercial Activity

Industrial and commercial activity would not be affected by this permitting action in the facility or in the neighboring area by issuing Permit #2667-12.

K. Locally Adopted Environmental Plans and Goals

The Department considered locally adopted environmental plans and goals in issuing Permit #2667-12. The Columbia Falls area was designated as a PM_{10} nonattainment area on November 15, 1990. Columbia Falls has an approved State Implementation Plan (SIP) to address the emission sources of PM_{10} in the area. The Department has taken the PM_{10} status of Columbia Falls into consideration while drafting Permit #2667-12. Therefore, the impacts from this project on the Locally Adopted Environmental Plans and Goals would be minor.

L. Cumulative and Secondary Impacts

Increases in actual pollutant emissions above historical levels may result in minor cumulative and secondary impacts to the human environment. Because of relatively small increases in actual air pollutant emissions of NO_X, CO, VOC, SO_2, PM_{10}, and PM from historical emission levels minor cumulative or secondary impacts are expected to result from this project.

Recommendation: No EIS is required.

If an EIS is not required, explain why the EA is an appropriate level of analysis: This permitting action does not include any additional air pollution emissions above current levels; it was requested to resolve an administrative issue. Therefore, an EA is the appropriate level of analysis.

Other groups or agencies contacted or which may have overlapping jurisdiction: Department of Environmental Quality – Air Resources Management Bureau, National Park Service, United States Forest Service, United States EPA.

Individuals or groups contributing to this EA: Department of Environmental Quality – Air Resources Management Bureau

EA prepared by: Chris Ames
Date: November 9, 2004